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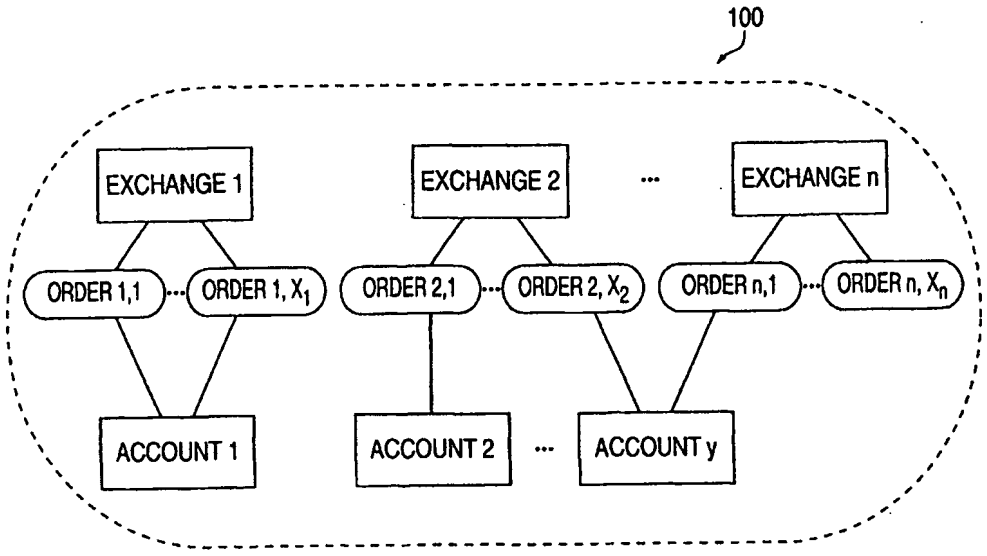

(57) Abstract

The present invention comprises an electronic trading system referred to as ETS (100). ETS allows traders to conduct commercial transactions with each other. ETS allows its traders to trade on an expandable and unlimited number of interconnected exchanges. Each trader enters his own orders on an exchange. ETS also allows its traders to create an expandable and unlimited number of accounts by which each trader organizes and controls the orders he has entered. The major types of orders a trader can enter are : bid, ask, correlated, negatively correlated and arbitrage. For each order a trader submits to ETS, the trader can select among the following four types of negotiation strategies: displayed, hidden, now–or–never and periodic. This four–tiered approach allows traders to pursue simultaneous automated negotiations.

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Method and Apparatus For Auctions With Automatic Matching

This application claims benefit of co-pending provisional application "Automatic Matching System," filed October 6, 1998, with inventors Andrew Lustig and Jeffrey Isaac, and having application number 60/103,276.

FIELD OF THE INVENTION

The present invention relates generally to electronic trading systems, and more particularly to automatically matching trading systems.

BACKGROUND OF THE INVENTION

In general, automatic matching systems allow parties to enter orders, from which trades will be generated, governed by the rules of the system. The terms of the trade are always pre-determined. None of the parties to a trade knows in advance the price of the trade, nor with whom they will be matched.

Automatic matching of buyers and sellers may reduce or eliminate the market-maker spread, accommodate the need for anonymity, and reduce the market impact of large orders.

Existing automatic matching systems are highly rigid. There are substantial costs to such rigid systems.

For example, direct access to the existing trading systems and exchanges is highly restricted. Because an investor cannot directly access the market, he must pay a commission to a broker, and must (in non-auction markets, as the result of the market-maker spread) often accept a sub-optimal price.

Another example of the rigidity of existing trading systems is their limiting of orders and trades to one set of terms. Because these terms are sub-optimal to many traders, many orders tend to be less competitive or even lost to the market.

Furthermore, existing systems are restricted to one type of product, e.g. stocks or bonds.

Furthermore existing systems provide disincentives to submitting fully competitive orders, in that more competitive prices often lead to less favorable price execution.

It would therefore be desirable to provide an automatic trading system that has less rigidity than existing trading systems and has greater capabilities.

SUMMARY OF THE INVENTION

The present invention comprises an electronic trading system that shall be referred to as the Eureka Trading System or ETS.

ETS allows "traders" to conduct commercial transactions with each other. A "trader" is any legal entity capable of being a party to a commercial transaction.

ETS allows its traders to trade on an expandable and unlimited number of interconnected exchanges. Each trader enters each of his or her orders on an exchange. ETS also allows its traders to create an expandable and unlimited number of accounts by which each trader organizes and controls the orders he or she has entered.

The major types of orders a trader can enter are: bid, ask, correlated, negatively correlated and arbitrage. Each of these order types is discussed below. It is important to note that ETS may fill a trader X's (where "trader X" is an arbitrary trader on ETS) order by the aggregation of multiple orders on the same side of the transaction as trader X and/or the aggregation of multiple orders on the contra side of the transaction to trader X.

A trader X is therefore presented with a model, for interacting with ETS, that is at least partially represented by Figure 1A. As can be seen, trader X views ETS as comprising one or more exchanges (indicated in the diagram as Exchange 1, Exchange 2 ... Exchange n). The orders depicted in Figure 1A are the orders which trader X has placed on the exchanges. Trader X organizes the orders he or she has placed by having each of them in an Account. In Figure 1A, trader X is shown as having "y" different

accounts. Account 1 only has the orders which trader X has placed on Exchange 1 (order 1,1 and order $1,x_1$). Note that the notation "order r,g" refers to the g^{th} order placed by trader X on Exchange r. Account y shows the cross-exchange capability of accounts since this account has orders which trader X has placed on Exchange 2 (order $2,x_2$) and Exchange n (order n,1). Like all orders placed by trader X, order n,x_n is assigned to an account of trader X, but that account is not shown.

An exemplary embodiment of ETS, as a computer system, is depicted in Figure 1B. This figure shows an unlimited number of traders (from 1 to t) which each communicate with ETS through a Trader Computer numbered Trader Computer 1, Trader Computer 2 ... Trader Computer t. In this exemplary embodiment, the Trader Computers communicate with ETS over the Internet. ETS itself communicates with over the Internet through a Network Interface 110. ETS, indicated by dashed encirclement 111, is comprised of a processor 112 and a memory 113. Memory 113 is comprised of three main sections: Cross-Trader Data Base 114, Per-Trader Data Base 115 and application software storage 116. Cross-Trader Data Base 114 is comprised of data bases for each Exchange in ETS. As can be seen, Figure 1B depicts an Exchange data base for each of the "n" Exchanges depicted in Figure 1A. Per-Trader Data Base 115 is replicated for each trader on ETS. Each such Per-Trader Data Base 115 stores the Accounts of a particular trader, as well as any individual settings by that trader. In Figure 1B it will be assumed that Per-Trader Data Base 115 represents trader X. Application software storage 116 stores the programming 123, that is executed by processor 112, to cause ETS to function as described herein.

For each order a trader submits to ETS, the trader can select among the following four types of negotiation "strategies": displayed, hidden, "now-or-never" and periodic (these four order types are defined in the Glossary of Appendix 1). This four tiered approach allows traders to pursue simultaneous automated negotiations without revealing valuable information to the other traders. Typically, for example, the periodic order is a more aggressive offer than a trader might make through a displayed or hidden offer. Also, typically,

the displayed order is the least aggressive offer a trader may make and serves mainly as an invitation for other traders to make contra-offers.

ETS integrates exchanges (and therefore markets) for all types of products (both tangible and intangible) by processing all orders, and the trades that result from them, through a common automatic order-matching engine.

This common automatic order-matching engine is depicted in Figure 1A by the dashed encirclement 100 which encompasses trader X's entire model of interaction with ETS.

This common automatic order-matching engine controls trading according to each trader's settings at the Global, Exchange, Account and Order levels. These Global, Exchange, Account and Order levels settings are collectively referred to as the ETS Settings System. Global settings by a trader X apply to all orders of trader X anywhere in ETS. Exchange settings for a trader X apply to all orders of trader X for the particular Exchange in which the setting has been made, and do not apply to orders in any other Exchanges. Account settings by a trader X apply to all orders in the account of trader X in which the settings have been made. An Arbitrage account of trader X contains only the instruction by trader X (to the system) to automatically execute arbitrage trades for that account of trader X whenever possible, as per the arbitrage account's settings. There are also a variety of order entry settings which apply only to the particular order with which they are entered by trader X. Whether at the global, exchange, account or order level, these settings allow traders to define the rules by which various permutations of their orders will be generated, prioritized and executed during the order matching process. Settings are organized on a per-trader basis, meaning that: i) every trader on ETS accesses his or her own set of settings; and ii) no trader on ETS is permitted to access the settings of another trader.

Relating the foregoing paragraph to the computer system implementation of Figure 1B, it can be seen that the Accounts and settings for trader X are stored in Per-Trader Data Base 115. Each Account is comprised of two main sections, that are illustrated with respect to Account 1: Account

Settings 119 and Account Order list 120. Account Settings 119 store the Account level settings, of the ETS Settings System, which trader X has set for Account 1. Account Order list 120 is a list of pointers to each of the orders that is organized by trader X under Account 1. The actual orders of Account 1 are stored in the various Exchange data bases of the Cross-Trader Data Base 114. Each order, as stored in its Exchange data base, has stored with it the order-level settings of the ETS Settings System. The Exchange-level settings (of the ETS Settings System) for trader X are stored in Exchange Settings Region 121 of Per-Trader Data Base 115, while the Global settings (of the ETS Settings System) for trader X are stored in Global Settings Region 122.

An overview of how ETS functions is as follows. A Glossary is provided in Appendix 1 of this document. Certain terms in the following discussion are surrounded by quotes to emphasize the fact that they may be found in the Glossary. Alternatively, a term may be surrounded by double quotes to indicate its definition at that particular point in the description, rather than through a Glossary entry.

When a "trader" submits an order for automatic matching on an "Exchange," if it is identified as a "test order" according to the rules discussed below in Section 1.1, the test order is compared against any orders in the "Order Book" to determine whether any "matches" can be identified. The orders against which the test order can be matched include "displayed" book orders as well as "hidden" book orders. ETS will attempt to immediately execute the matched trade that maximizes satisfaction (i.e., the present value net price improvement) for the trader whose order is being tested. If no such trade can be executed with the test order, the test order (unless "now-or-never") will remain until canceled or expired, and will be entered into the Order Book or "Periodic Order File."

Relating the foregoing paragraph to the computer system implementation of Figure 1B, it can be seen that each Exchange data base is comprised of two main sections, that are illustrated with respect to data base "Exchange 1": Periodic Order File 117 and Order Book 118.

The automatic matching process examines many possibilities in the attempt to maximize the satisfaction to the test order, including: i) various terms and methods of payment and delivery, for the test order and any other orders it is matched with as part of a potential trade (this is referred to as "permuting" an order), ii) "aggregation" of orders, and iii) utilization of "arbitrageurs." The permutations are subject to the various relevant pre-existing "global," "exchange" and "account" settings of the parties.

It may be preferable in some embodiments to limit the amount of searching ETS performs in finding an optimal price improvement by utilizing heuristics, neural networks or other approximate techniques. Such approximate techniques are not guaranteed to result in the most optimal price improvement, but still yield a reasonably optimized selection in less time.

In general, the ETS proprietary automatic order matching engine initiates the matching process every time a "test packet," defined as follows, is identified. A test packet may contain zero or more orders. A test packet may also contain zero or more edited settings. A test packet must contain at least one order or one setting.

A test packet may be created by a trader collecting multiple orders (either new or edited) and/or instructions (i.e., edited settings) in his OUTBOX (see Settings of Section 2) and then submitting them simultaneously through the SUBMIT selection (once again, see Settings of Section 2). The trader who submits the test packet is known as the "test trader." Alternatively, a test packet may consist of those periodic orders, belonging to accounts of a particular trader, scheduled to be tested in a current period. In this case, the test trader is the trader who owns the accounts whose periodic orders are forming the test packet.

The basic process for order matching by the present invention is depicted in Figure 1C, and is described as follows. The order matching process begins whenever a test packet has been identified for a trader, where the trader owning the test packet is referred to as the test trader. Step 130. The first major task of the order matching process (as implemented by the automatic order matching engine) is to determine all potential trades that are

enabled by the current "test packet." Step 131. The next major task of the order matching process is to determine a combination of potential trades which, if executed, would result in a greatest total price improvement to the test trader. Step 132. As discussed above, it may be desirable, in certain embodiments, to use approximate techniques which will result in an approximately greatest total price improvement. As discussed below, ETS charges a price improvement fee to the test trader. The price improvement given to the test trader, after ETS has extracted its fee, is called the net price improvement. ETS calculates its price improvement fee such that the net price improvement received by the test trader is never less than zero.

In order to determine which combination of potential trades offers the greatest (or approximately greatest) total price improvement, a number of combinations of potential trades must be evaluated for their total price improvement and a selection among them made. The total price improvement for a particular combination of potential trades is determined as follows, and is depicted in Figure 1D. A total price improvement variable, for the combination of potential trades whose total price improvement is to be determined, is initialized to zero. Step 140. A loop is then begun for each potential trade (referred to as the current potential trade) of the combination of potential trades. Step 141. Within the loop of Step 141, the following actions are taken. Each current potential trade has a test order (referred to as the current test order), making up that trade, which is the order that belongs to the test trader. Step 142. The price improvement for the current potential trade is the price improvement resulting to its current test order. This price improvement to the current test order (referred to as the current price improvement) is determined in Step 143. The total (or aggregate) price improvement of the combination of potential trades is simply the sum of the current price improvements for each of the current potential trades. This accumulating function is accomplished by Step 144. Step 145 indicates the end of loop 141.

For an arbitrage order to be executed there must be a sufficient spread between the (net) bid and ask prices (available to the arbitrageur) to

accommodate the arbitrageur's requirements, including the arbitrage fee and (if applicable) price improvement fee charged by ETS.

After every trade, the parties to that trade will be notified ("the notification") via e-mail (and through additional mechanisms, e.g. Internet fax, pager, first class US Mail or Telephone) and a Trade Report will be placed in their server side mailboxes.

Particular aspects of the present invention include the following.

Having an electronic trading system, comprising one or more electronic trading exchanges, automatic matching and a credit roster by which a first trader can set at least one credit line for at least one other trader on the trading system. Further providing an electronic trading system with any combination of: i) a credit expansion table by which the first trader specifies an amount by which an offer by the at least one other trader, which exceeds the credit line of the at least one other trader, is discounted; ii) a minimum credit requirement factor by which a first trader modifies contra-trader credit line utilization for various trades; or iii) a credit hold table specifying at least one length of time by which an available credit portion, of the credit line, is temporarily reduced, in accordance with trade terms.

Having an electronic trading system, comprising one or more electronic trading exchanges, automatic matching and a first risk parameter by which a first trader can specify an amount of discounting to be applied to an offer by at least one other trader on the system. Further providing an electronic trading system with any combination of: i) the first risk parameter being a credit risk parameter; ii) the first risk parameter being a slow pay parameter; or iii) a credit risk multiplier by which at least one credit risk parameter is adjusted for varying periods of credit hold time.

Having an electronic trading system, comprising one or more electronic trading exchanges, automatic matching and a budget table by which a first trader can set at least one budget for each of at least one payment terms. Further providing an electronic trading system with budgets that are interrelated.

Having an electronic trading system, comprising one or more electronic

trading exchanges, automatic matching and at least a first setting by which a first trader can select variable terms the first trader finds acceptable for payment of trades into which the first trader may enter into on the trading system. Further providing an electronic trading system with the terms for payment being a number of days.

Having an electronic trading system, comprising one or more electronic trading exchanges, automatic matching and at least a first setting by which a first trader can select variable methods the first trader finds acceptable for payment of trades into which the first trader may enter into on the trading system.

Having an electronic trading system, comprising one or more electronic trading exchanges, automatic matching and at least a first setting by which a first trader can select variable terms the first trader finds acceptable for delivery of trades into which the first trader may enter into on the trading system. Further providing an electronic trading system with the acceptable terms for delivery including deferred delivery.

Having an electronic trading system, comprising one or more electronic trading exchanges, automatic matching and at least a first setting by which a first trader can select variable methods the first trader finds acceptable for delivery of trades into which the first trader may enter into on the trading system.

Having an electronic trading system, comprising: one or more electronic trading exchanges; at least a first exchange for trading by automatic matching on which a first trader has placed at least a first order; at least a second exchange for trading by automatic matching on which the first trader has placed at least a second order; and a system-wide automatic order matching engine that controls the execution of at least the first and second orders placed by the first trader. Further providing an electronic trading system with any combination of: i) the system-wide automatic order matching engine updating a budget for the first trader based upon which combination of the first and second orders is executed; ii) the system-wide automatic order matching engine: identifying the first and second orders as test orders;

determinig that either one, but not both, of the first and the second orders can be executed; and choosing one of the first and second orders for execution depending upon which of the first and second orders provides the maximum present value price improvement to the first trader; or iii) the system-wide automatic order matching engine: determining that both the first and the second orders are with a same first contra-trader; and updating a credit-in-use value for the first contra-trader based upon which combination of the first and second orders is executed. For the case of (i), wherein a budget is updated, further providing that an amount by which the budget is updated is determined by an executed trade amount being multiplied by a budget requirement factor of the first trader.

Having an electronic trading system, comprising: at least a first exchange for trading by automatic matching; and a set of system-wide order management tools by which at least a first trader can simultaneously and automatically control his trading activity in all exchanges.

Having an electronic trading system, comprising: at least a first exchange for trading by automatic matching on which a first trader has placed at least a first order, wherein the first order is comprised of at least a sub-order to sell and a sub-order to buy, wherein the sub-order to sell and the sub-order to buy may be on a same or each on a different exchange; and a system-wide automatic order matching engine that monitors orders placed by the first trader, wherein the matching system only executes the first order when it determines that both the sub-order to sell and the sub-order to buy can be executed. Further providing an electronic trading system such that the matching system determines that both the sub-order to sell and the sub-order to buy can be executed if a differential cost of executing the two sub-orders, for the first trader, satisfies a first condition. Further providing that the first condition specifies that the differential cost be less than or equal to a monetary amount.

Having an electronic trading system, comprising: at least a first exchange for trading by automatic matching on which a first trader has placed at least a first order, wherein the first order is comprised of two or more

sub-orders, wherein the two or more sub-orders may each be on any exchange; and an automatic order matching system that controls execution of orders placed by the first trader, wherein the executes system only executes a single sub-order of the first order.

Having an electronic trading system, comprising: at least a first exchange for trading by automatic matching on which a first trader has placed at least a first order, wherein the first order is comprised of at least a sub-order to sell and at least two sub-orders to buy, wherein the sub-orders may each be on any exchange; and a system-wide automatic order matching engine that control execution of orders placed by the first trader, wherein the matching system only executes the first order when it determines that both the sub-order to sell and a sub-order to buy can be executed, and wherein only a single sub-order to buy is executed.

Having an electronic trading system, comprising: at least a first exchange for trading by automatic matching on which a first trader has placed at least a first order, wherein the first order is comprised of at least two sub-orders to sell and at least one sub-order to buy, wherein the sub-orders may each be on any exchange; and a system-wide automatic order matching engine that controls execution of orders placed by the first trader, wherein the matching system only executes the first order when it determines that both a sub-order to sell and the sub-order to buy can be executed, and wherein only a single sub-order to sell is executed.

Having a method for an automatic order matching engine, comprising the following steps: identifying a test packet submitted by a trader; identifying all potential trades enabled by the test packet; and determining a combination of potential trades which, if executed, would result in a greatest price improvement to the trader submitting the test packet. Further providing the method with the price improvement being an absolute, present value, aggregate and net price improvement. Further providing the method with the test packet exclusively consisting of those periodic orders belonging to accounts scheduled to be tested in a current period. Further providing the method with the combination of trades resulting in any combination of: i) an

execution of a test order against an aggregation of two or more contra-orders; or ii) an execution of a test order and at least one other same-side book order against one or more contra-orders.

Further providing the method with the combination of trades resulting in at least one test order matched against an arbitrage order. Further providing the method with the test packet including an arbitrage order.

Having a method for an automatic order matching engine, comprising the following steps: identifying a test packet submitted by a trader; identifying all potential trades enabled by the test packet; and determining a combination of potential trades which, if executed, would result in a greatest price improvement, according to an approximation technique, to the trader submitting the test packet. Further providing the method with the approximation technique being any combination of the following: an application of one or more heuristics; or an application of neural networks. Further providing the method with the price improvement being an absolute, present value, aggregate and net price improvement. Further providing the method with the test packet exclusively consisting of those periodic orders selected by a trader for inclusion in a periodic order sweep. Further providing the method with the combination of trades resulting in any combination of: i) an execution of a test order against an aggregation of two or more contra-orders; or ii) an execution of a test order and at least one other same-side book order against one or more contra-orders. Further providing the method with the combination of trades resulting in at least one test order matched against an arbitrage order. Further providing the method with the test packet including an arbitrage order.

Having an electronic trading system, comprising: one or more electronic trading exchanges; automatic matching; and an order book containing both displayed and hidden standing orders. Further providing the electronic trading system with any combination of: i) at least one periodic order; or ii) at least one now or never order.

Having an electronic trading system, comprising: one or more electronic trading exchanges; a system-wide automatic order matching

engine; and one or more modifiers by which a trader can create rules by which the system-wide automatic order matching engine creates one or more permutations of at least a first order. Further providing the electronic trading system with one or more modifiers which are any combination of the following: i) one or more interest rates by which prices for various payment terms are permuted; ii) one or more lot size modifiers by which prices for trades of various lot sizes are permuted; iii) one or more cummulative quantity modifiers by which prices for trades of increasing cummulative quantity are permuted; or iv) one or more progressive order execution modifiers by which orders permute as a result of changing inventory levels caused by trades executed on the system.

Advantages of the invention will be set forth, in part, in the description that follows and, in part, will be understood by those skilled in the art from the description or may be learned by practice of the invention. The advantages of the invention will be realized and attained by means of the elements and combinations particularly pointed out in the appended claims and equivalents.

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings, that are incorporated in and constitute a part of this specification, illustrate several embodiments of the invention and, together with the description, serve to explain the principles of the invention:

Figure 1A depicts a model for a trader interacting with ETS;

Figure 1B illustrates an exemplary embodiment for a computer system to implement ETS;

Figure 1C shows an overview of the automatic order matching process of the present invention;

Figure 1D depicts, in pseudo-code form, a sub-functionality of the automatic order processing method of Figure 1C;

Figures 2A to 2J depict the Global settings for the ETS system;

Figures 3A to 3C depict the Exchange settings for the ETS system;

Figures 4A to 4B depict the Account settings for the ETS system;

Figures 5A to 5D depict the order entry settings for the ETS system;

Figures 6A to 6M depict trade notification reports for the ETS system; and

Figure 7 depicts a market screen for the ETS system.

BRIEF DESCRIPTION OF PRINTED APPENDICES

The accompanying printed Appendix 1, that is incorporated in and constitutes a part of this specification, provides a Glossary of terms used to describe the invention and, together with the description, serves to explain the principles of the invention.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

Reference will now be made in detail to preferred embodiments of the invention, examples of which are illustrated in the accompanying drawings. Wherever possible, the same reference numbers will be used throughout the drawings to refer to the same or like parts.

1. SYSTEM DESCRIPTION

The present invention comprises an electronic trading system that shall be referred to as the Eureka Trading System or ETS.

ETS allows "traders" to conduct commercial transactions with each other. A "trader" is any legal entity capable of being a party to a commercial transaction.

ETS enables direct public participation, thereby allowing greater liquidity and efficiency in the market, and allowing greater opportunities for price improvement. Price improvement to a trader is, generally speaking, the extent to which a trader receives a better bargain than his or her minimally acceptable bargain. (Note that the ETS system always looks to maximize the present value of the price improvement since this provides a common currency by which different potential trades can be compared.) This is possible due to ETS's proprietary contra-trader order evaluation tools, which allows traders to automatically modify or invalidate their own orders based on the varying trade risks involved in each transaction. For example, ETS

provides each trader with Roster settings by which he or she can set global parameters for the cost of trading with, on an individual basis, any other trader on ETS. The Roster settings, and the other global functions that work with it (such as credit hold or credit risk multiplier), are described in detail in the sections of the patent that follow.

More generally, the Roster settings are part of the ETS Settings System (at the Global, Exchange, Account and Order entry levels), which allow traders to define the rules by which various permutations of their orders will be generated, prioritized and executed. This ETS Settings System also enables any number of payment and delivery options, thereby increasing market liquidity and efficiency.

ETS allows for an expandable and unlimited number of interconnected exchanges. Any number of exchanges may be created for fungible items (including, for example, stocks, bonds, currencies, commodities, futures, sports bets, telecommunications, and energy), nearly fungible items (including, for example, loans, various categories of coins, event tickets, and airline tickets) and unique items (including, for example, real estate and original artwork).

Exchanges may vary in many ways, including price format, fee schedules, and payment and delivery options. Consider the differences, for example, between an exchange for stocks and an exchange for sports wagers. An order for a stock would be presented as a quantity of shares and a price per share. An order for a sports bet would also be presented in quantity/price format, but the price is expressed as odds and the quantity is expressed in dollars.

ETS integrates exchanges (and markets) for all types of products (both tangible and intangible) by processing all orders and trades through a common automatic order-matching engine.

ETS provides its Global Settings System, a set of tools that can be applied across exchange boundaries, enabling cross-exchange integration. In addition, ETS provides its Account Settings System, which also provides a trader with a set of tools that can be applied across exchange boundaries.

Such cross-exchange tools allow traders to be more efficient and competitive when simultaneously pursuing opportunities in multiple exchanges.

Existing systems are indiscriminate in trade execution. For a trader unable or unwilling to perform all individually desirable trades, such systems force the trader to guess at the optimal order in which individual orders should be entered in order to provide him with the maximum satisfaction.

ETS allows a trader to simultaneously submit all individually desirable orders since ETS will automatically determine, for that trader, a satisfaction-prioritized basis for executing those orders, within defined constraints.

Existing systems do not accommodate correlated orders and negatively correlated orders. Therefore, traders are often less competitive because they cannot be sure which of their orders will be successful.

ETS allows traders to tie multiple orders together (i.e. correlated orders), allowing them to be more competitive. A good example is the trader looking to sell his home and buy another. That trader will likely be a more competitive buyer and a more competitive seller if he knows that both trades can only be executed simultaneously. The system accommodates this trader by allowing him to create a combo order, including any number of items to be sold, and any number of items to be purchased. The order price would be typically be set as the price differential between the items to be sold and the items to be bought. Consider the following specific example. If the trader wants 200K$ for his house, and will pay 300K$ for the other house, the differential is +100K$. If the owner of the 300K$ house wants 310K$, the 200K$ house is effectively not available to other buyers at anything less than 210K$. In this way, the system can effectively generate bilateral and multilateral barter transactions.

Furthermore, ETS can accommodate negatively correlated orders, e.g. an "either/or" order. Again, a good example is the home buyer, who is willing to bid competitively for many different houses provided that he can be sure he will only buy the specified number of houses.

Furthermore, ETS can accommodate negatively correlated combo

orders. Extending the above examples, the potential home buyer/seller can create an order by which he will tie the sale of his home to the purchase of any one of a number of other homes. By defining negative correlation, meaning in this case that he is unwilling to do any more than one of the possible purchases, he is able to simultaneously pursue multiple potential trades.

In existing systems, including auction markets such as the New York Stock Exchange, only the price of the trade is exposed to the market in search of a better deal. Other considerations, such as the commission rate and the interest rate at which the purchase may be financed, are negotiated between the investor and broker. Even if the investor receives the best possible price, he may not receive the best possible total deal (that is, the lowest possible cost of the entire transaction).

ETS provides more efficient and complete price improvement by allowing each trader to automatically modify his orders, within the framework provided, for various variable costs and considerations. Costs and considerations vary in that they may be applicable to trades on any exchange, in specific exchanges, or for specific accounts. Therefore, the system allows the trader to define various Global, Exchange and Account settings. Additionally, all orders are automatically modified to compensate for any trading fees charged by ETS, an important consideration given that a trader does not know, upon placing an order, whether or not ETS will be charging the trader a fee.

Existing automatic matching systems use various techniques for trade pricing and execution. In the simplest technique, the system will match as many orders as possible, at a defined point in time, based on trades or quotes in another exchange. Another technique, used by some automatic matching systems, is to periodically determine the price that will clear the greatest trading volume (or provide the greatest aggregate satisfaction to all traders), and assign that price to the trades that can be executed at that price.

In general, the ETS proprietary automatic order matching engine initiates the matching process every time it determines that at least one new

(or effectively new) order has been placed, creating a truly continuous market within which instantaneous auctions can take place.

The matching system is enhanced by the ETS automatic arbitrage and aggregation systems, which can alone or in combination with each other increase price improvement and/or enable trades that might have otherwise not taken place.

The matching system is also enhanced by the ETS four tiered order creation system, in that the negotiation process is effectively automated. A trader can define a negotiation strategy for any order he submits to ETS by using up to four types of order pricing: displayed, hidden, "now-or-never" and periodic (these four order types are defined in the Glossary of Appendix 1). This four tiered approach allows traders to pursue simultaneous automated negotiations without revealing valuable information to the other traders. Typically, for example, the periodic order is a more aggressive offer than a trader might make through a displayed or hidden offer. Also, typically, the displayed order is the least aggressive offer a trader may make and serves mainly as an invitation for other traders to make contra-offers.

ETS may be implemented on the Internet or through any other suitable means of communication.

An overview of how ETS functions is as follows. A Glossary is provided in Appendix 1 of this document. Certain terms in the following discussion are surrounded by quotes to emphasize the fact that they may be found in the Glossary. Alternatively, a term may be surrounded by double quotes to indicate its definition at that particular point in the description, rather than through a Glossary entry.

If a "trader" submits an order for automatic matching on an "Exchange" it may become (according to the rules discussed below in Section 1.1) a test order. Such a test order may find a "match" against any orders in the "Order Book," which includes "displayed" orders as well as "hidden" orders. ETS will attempt to immediately execute the matched trade that maximizes satisfaction for the trader who entered this test order. If no such trade can be executed with the test order, the test order (unless "now-or-never") will remain effective

until canceled or expired, and will be entered into the Order Book or "Periodic Order File."

The automatic matching process examines many possibilities in the attempt to maximize the satisfaction to the test order, including various terms and methods of payment and delivery, "aggregation" of orders, and utilization of "arbitrageurs."

It may be preferable in some embodiments to limit the amount of searching ETS performs in finding an optimal price improvement by utilizing heuristics, neural networks or other approximate techniques. Such approximate techniques are not guaranteed to result in the most optimal price improvement, but still yield a reasonably optimized selection in less time. In no case will such techniques yield negative price improvement.

All automatically matched trades are subject to the various relevant pre-existing "global," "exchange" and "account" settings of the parties.

A trader may submit multiple orders and/or instructions (e.g., edited settings) simultaneously by collecting multiple orders and/or instructions in his OUTBOX (see Settings of Section 2) and then submitting them simultaneously through the SUBMIT selection (once again, see Settings of Section 2). A collection of one or more orders and/or instructions shall also be referred to, for purposes of this patent, as a "test packet." The process by which a test packet initiates the order matching process (and a more detailed definition of test packet) is presented below in Section 1.1. As with the submission of a single order, the automatic matching process examines many possibilities in the attempt to maximize the satisfaction to the trader owning the test packet.

For example, a trader may wish to submit a test packet which would result in test orders that would total more than the total budget of the trader. Once again, ETS will seek to determine the subset of potential trades whose execution would result in maximized satisfaction to the trader who has submitted the test packet, while keeping within the budget specified by the trader.

1.1 THE ORDER MATCHING PROCESS

The process by which orders are matched is further specified in this section.

The purpose of the order matching process (as implemented by the automatic order matching engine) is to analyze all potential trades that may be generated by the current "test packet," which is defined as follows. A test packet may contain zero or more orders entered simultaneously by one trader (the "test trader"), where each order is treated as a test order and may either be a new or edited order. A test packet may also contain zero or more edited settings. A test packet must contain at least one order or one setting. The entry of such a test packet initiates the order matching process in which the events of the test packet are analyzed to determine whether test orders may be executed, or whether the packet makes execution of any trades possible that may not have been possible prior to the test packet (i.e., when any test packet event makes any order potentially more competitive). Any price improvement, in the potential trades is allocated to the test trader. Suitable events for inclusion in a test packet include (but are not limited to) the following:

(i) New orders are submitted.

(ii) A bid is increased.

(iii) An ask is decreased.

(iv) A trader increases a credit line, interest rate for bids/purchases, or deferred delivery discount for asks/sales.

(v) A trader increases a budget or reduces a budget requirement factor.

(vi) A trader reduces a credit risk factor, credit risk factor multiplier, credit expansion factor, deferred delivery discount for bids/purchases, interest rate for asks/sales, minimum credit requirement factor, arbitrage markup, or handling fee.

(vii) A trader removes or changes a superior account selection.

(viii) A trader's trading hours begin or a trading halt or suspension ends.

(ix) A hold on credit expires.

(x) A periodic order is tested.

(xi) An (account or order level) bid discount or ask premium is reduced.

(xii) An (account or order level) bid premium or ask discount is increased.

(xiii) A trade causes a cumulative order modifier (set at the account or order level) to make an order more competitive.

Once the matching process has been initiated, a variety of conditions will govern whether orders match. Some of the more basic considerations, in determining a match, are as follows:

(i) The orders must be valid for the given item.

(ii) The quantity must be acceptable to the parties to the trade.

(iii) Payment and delivery terms and methods must match.

(iv) A trader's order may be matched against another trader's order, or against his own order.

(v) The system will not automatically match trades that exceed the amount of the buyer's corresponding budget, divided by his budget requirement factor.

Other considerations in the process of matching orders are as follows.

(i) The matching process always maximizes the benefit to the test trader.

(ii) If a trader simultaneously submits multiple orders, budget constraints and credit settings may create the need to prioritize matches before execution. (For example, a trader raises a contra trader's credit line from $0 to $5000. The order matching engine identifies $20,000 worth of individually possible trades, but the credit expansion settings effectively limit the sales that can be made to something less than $20,000. ETS will execute that combination of trades that maximizes the net aggregate price improvement to the test trader.)

(iii) Similarly, if a trader's new settings (e.g. an increased budget or credit line) initiate the order matching process, the order matching engine

will execute the trades that maximize his net aggregate price improvement.

(iv) When testing for potential trades, all orders (and non-order trading instructions, such as setting changes) concurrently submitted (individually, or together via Outbox) will be considered in the processing of each individual entry.

(v) All matches generated by the trader's test packet will be processed together, allowing for the system to execute the combination of trades that maximize his net (aggregate absolute present value) price improvement. (Price improvement is calculated as demonstrated on the Trade Analyses Figures 6B, 6D, 6G and 6H.)

(vi) The (new or edited) hidden, displayed and NON bids and asks will be tested against the book for all possible trades, for each combination of payment and delivery terms and methods. Note that:

(a) Periodic orders are NOT tested on submission, and are not placed on the book.

(b) Direct matches (i.e. buyer and seller, no arbitrageur) will be sought (on matched payment and delivery terms and methods) against various individual and aggregated traders.

(c) Arbitrage matches will be sought for orders with matched and mismatched payment terms and/ or methods.

(d) The test trader may be matched against his own test and/or book orders.

(vii) Slow delivery fees are "collected" only by the ultimate buyer, and are assessed against all traders shipping the material. For example, if the seller ships to an arbitrageur, and he in turn ships to the buyer, the buyer will collect (compounding) slow delivery fees from both other traders, as per his own settings for those traders. (A 10% slow delivery fee on the arbitrageur and a 5% fee on the seller would generate a compounded slow delivery fee of 14.5%.) The arbitrageur does not "collect" any slow delivery fees, even if he has set such a fee for the seller. (Some trades on some exchanges may not require delivery. Slow delivery fees will not apply to such trades.)

(viii) Ties (in price improvement) will be broken by the following parameters, in the following order:

(a) Trades for a higher total test bid or ask value (i.e. bid or ask multiplied by quantity, NOT total trade value) have priority.

(b) Trades that involve the least amount of credit use ($ value multiplied by days) by the contra trader have priority.

(c) Trades with a contra trader with a higher system activity rating have priority.

(ix) There are many ways in which a change in a trader's non-order trading instructions (e.g. budget, credit, roster, handling fees, and account settings) may enable a trade that could not previously have occurred. Therefore, these "non-order trading instructions" also initiate the order matching process.

Important considerations, regarding the determination of price improvement, are as follows.

(i) Typically, for all automatically matched trades in which a trader receives price improvement, ETS will charge a price improvement fee (assessed on the value of the trade and payable by the party receiving price improvement). In no case will that trader's price improvement fee exceed his (present value) price improvement.

(ii) If a trader receiving price improvement is part of an aggregated trade, he will pay the price improvement fee based on the value of all of the same-side trades.

The credit utilized, for the contra trader, is determined as follows:

(i) For immediate delivery sales, the present value of the sale.

(ii) For sales where delivery terms do not apply (e.g. intangibles) the present value of the sale.

(iii) For deferred delivery sales, the present value of the sale multiplied by the Minimum Credit Requirement Factor.

(iv) For purchases, the amount of the modified bid (i.e. adjusted for all order modifiers and, if applicable, the Deferred Delivery Discount) multiplied by the quantity of the trade, and (if the payment due date is on or

after the date on which the credit hold on the contra trader ends) multiplied by the Minimum Credit Requirement Factor.

(v) If the contra trader is oneself, zero.

1.2 ARBITRAGE

The following specific considerations are important with respect to arbitrage orders on ETS.

For an arbitrage order to be executed there must be a sufficient spread between the (net) bid and ask prices (available to the arbitrageur) to accommodate the arbitrageur's requirements, including the arbitrage fee and (if applicable) price improvement fee charged to the arbitrageur by ETS.

The arbitrageur cannot buy on deferred delivery and sell for immediate delivery.

The arbitrageur cannot buy on deferred delivery and sell for deferred delivery unless the arbitrageur's credit hold on the seller will be removed on or before the date on which the buyer is obligated to remit payment.

(If the initial seller is selling on immediate delivery) The initial seller will drop ship the items to the first deferred delivery seller in the chain, if any. If all trades in the chain are for immediate delivery, the initial seller will drop ship the items to the ultimate buyer.

(If the initial seller is selling on deferred delivery) The initial seller will ship the items to the first buyer in the chain. That buyer will then drop ship the items to the next deferred delivery seller in the chain, if any. If there are no additional deferred delivery trades in the chain, the items will be drop shipped to the ultimate buyer.

The arbitrage fee for each exchange is fixed by ETS, and is typically set as a percentage of the present value of the purchase. See line 650 of Figure 6J for an example present value of the purchase.

Multiple arbitrageurs may be utilized to bring a buyer and seller together, in the following two ways:

(i) Seller A may sell to Arbitrageur B, who sells to Arbitrageur C, who sells to Buyer D.

(ii) Seller A may sell to multiple arbitrageurs, who then sell to Buyer D.

Any number of arbitrageurs may be utilized for either of these processes, which may also be combined to enable the optimal arbitrage.

(If the bid is the test order) The arbitrageur's cost equals the net ask from the seller to the arbitrageur.

(If the ask is the test order) The arbitrageur's selling price equals the net bid from the buyer to the arbitrageur.

(If the arbitrage order is the test order) The arbitrageur's cost equals the net ask from the seller to the arbitrageur, and the arbitrageur's selling price equals the net bid from the buyer to the arbitrageur.

1.3 TRADE NOTIFICATION AND ANALYSIS

After every trade, the parties to that trade will be notified ("the notification") via e-mail (and through additional mechanisms, e.g. Internet fax, pager, first class US Mail or Telephone) and a Trade Report will be placed in their server side mailboxes. Because there is a risk that fraudulent notifications can be sent by individuals impersonating ETS, in one embodiment the notification sent by ETS never includes the contra trader ID thus requiring the notification recipient to contact ETS for authentication before the notification recipient can act on the notification.

The e-mail message will advise the trader that he must review the Trade Report via the *server side* mailbox. In a preferred embodiment, he will be suspended on an system-wide basis if:

(i) He does not acknowledge a purchase report (for which he has been sent an e-mail trade notification) by the end of the nth day following the day on which payment is to be mailed.

(ii) He does not acknowledge a sale report (for which he has been sent an e-mail trade notification) by the end of the nth day following the day on which the merchandise is to be shipped.

(iii) He does not acknowledge a *system* rule or disclaimer change, or any other change to the trader agreement, before the defined

deadline.

If a trader does not acknowledge an *exchange* rule or disclaimer change before the defined deadline, he will be automatically suspended from that exchange.

As will be clear to one of skill in the art, Figures 6A to 6M depict exemplary trade reports for transmission to a trader (by being placed in a server side mailbox) on the ETS system.

Figure 6D shows a detailed "Purchase Analysis" report which presents a detailed analysis of a purchase. Specifically, a buyer has submitted a periodic bid which has been satisfied by the purchase of 8 items (each item being a 1907 $20.00 coin) from a seller "JEF." This periodic bid was the test order, in relation to the ask order it was filled by and therefore is a candidate for price improvement. An advantage of periodic orders is that, since they are never left on the book, if they are filled they are always the test order. A corresponding "Sales Analysis" report is sent to the seller in this transaction, but this sales report would show zero price improvement since the ask order was the book order. An example zero price improvement Sales Analysis report, not corresponding to the particular transaction which is illustrated in Figure 6D, is shown in Figure 6B and is discussed below.

Figure 6D is depicting the one particular permutation of the buyer's bid which matched with one particular permutation of one particular book ask to result in maximum present value price improvement to the buyer.

Some specifics, regarding Figure 6D, are as follows.

Periodic Bid 627 ($88,000.00) represents the initial single unit present value bid that the buyer is willing to make, multiplied by the quantity of the trade, without applying any settings of the buyer. Modified Bid 628 ($82,764.00) represents the value of the group of 8 items to the buyer. Specifically, Periodic Bid 627 has been modified by Cumulative Quantity Modifier, Lot Size Premium, Account Bid Modifier and Deferred Delivery Discount in order to produced Modified Bid 628. Sub-total 629 ($74,896.58) represents the value to the buyer of the commitment to sell by the particular seller that is on the other side of the transaction represented by this Purchase

Analysis report. Specifically, sub-total 629 has been modified by the following settings, which have been set by the buyer for the particular seller: Credit Expansion Discount, Credit Risk Discount and Slow Delivery discount. Net Periodic Bid 620 is simply sub-total 629 adjusted for handling fees.

"Total Purch" 626 ($72,000.00) represents what the seller is willing to sell the 8 items for, to this particular buyer, with payment in 30 days and given the settings represented by this Purchase Analysis report. "Total Purchase" 621 ($71,296.00) represents the present value, to the buyer, of the seller's "Total Purch" 626 30-day ask.

"Price Improvement" 622 ($3,598.38) is the difference between Net Periodic Bid 620 and "Total Purchase" 621. From Price Improvement 622 ETS subtracts a "Price Improvement Fee" 623 ($180.00), which is calculated as a percentage of the value of the entire transaction. Therefore, the "Net Price Improvement" 624 ($3,418.38) to the buyer is Price Improvement 622 minus Price Improvement Fee 623.

"Credit Hold" 625 ($82,764.00) is the amount of credit required of the seller, by the buyer, for this transaction. Note that the amount of Credit Hold required is the value to the buyer of the items to be bought, multiplied by the credit requirement factor. This is Modified Bid 628.

Figure 6B shows a detailed "Sale Analysis" report which presents a detailed analysis of a sale. Specifically, a seller had a book ask that has been satisfied by the sale of 8 items (each item being a 1907 $20.00 coin). Since this was a book order, it was not a candidate for price improvement. A corresponding "Purchase Analysis" report, as discussed above for Figure 6D, was sent to the buyer (who did receive any price improvement).

Figure 6B is depicting the one particular permutation of one particular seller's ask which matched with one particular permutation of the test bid to produce the maximum present value price improvement to the buyer.

Some specifics, regarding Figure 6B, are as follows.

Hidden Ask 601 ($64,000.00) represents the initial single unit present value ask that the seller is requiring, multiplied by the quantity of the trade, without applying any settings of the seller. Sub-total 603 ($66,708.00)

represents the value of the group of 8 items to the seller. Specifically, Hidden Ask 601 is modified by the Account Ask Modifier and the Ask Modifier in order to produce sub-total 603. Net Ask 602 is simply sub-total 603 adjusted for handling fees. Net Ask 602 is the amount of the ask, required by the seller, without considering the particular contra-trader. Total Sale 604 is the amount of the ask, required by the seller, for the particular contra-trader with whom the transaction was concluded, under 30-day payment terms. Present Value of Sale 605 ($111,969.48) is the present value, to the seller, of Total Sale 604. Present Value of Sale 605 multiplied by the credit requirement factor is the amount of the Credit Hold 606 required by the seller of the buyer. When adjusted for the contra-trader specific factors of Credit Expansion Discount, Credit Risk Discount and Slow Pay Discount, the Net Present Value of Sale 607 is equal to the Net Ask 602. This is because the seller is, in this particular instance, the book order and is therefore not entitled to receive price improvement. Therefore, Price Improvement 608 is zero.

Figure 6A depicts a sales report, at an overview level, that corresponds to the detailed sales report of Figure 6B.

Figure 6C depicts a purchase report, at an overview level, that corresponds to the detailed purchase report of Figure 6D.

Figure 6G shows a detailed Sales Analysis report which is similar to the detailed Sales Analysis report of Figure 6B, except that Figure 6G is an aggregated sale. As with Figure 6B, the seller had its ask in the book and therefore received no price improvement. The seller sold a total of 25 items to 4 different buyers (the buyers being "FBC," PBC," "JEF," and "KLR"). One of the 4 buyers had the test bid which received the price improvement, if any price improvement existed.

Figure 6H shows a detailed Purchase Analysis report which is similar to the detailed Purchase Analysis report of Figure 6D, except that Figure 6H is an aggregated purchase. As with Figure 6D, the buyer had its bid as the test order and therefore received price improvement. The buyer bought a total of 25 items from 4 different sellers (the sellers being "JEF," "PBC," "JBK," and "KLR"). None of the 4 sellers received price improvement since only one

party to a transaction can be the test order and therefore receive any price improvement that may exist.

Figure 6E depicts an aggregated sales report, at an overview level, that corresponds to the detailed aggregated sales report of Figure 6G.

Figure 6F depicts an aggregated purchase report, at an overview level, that corresponds to the detailed aggregated purchase report of Figure 6H.

Figure 6I illustrates an overview report of an arbitrage transaction from the perspective of the arbitrageur. The arbitrageur bought 10 items and sold 10 items. The arbitrageur's arbitrage order, in this transaction, was a book order and therefore not entitled to price improvement (although the arbitrageur did, as always, make his spread). Either a seller to the arbitrageur or a buyer from the arbitrageur is the test order and therefore recipient of any resulting price improvement.

Figure 6J illustrates a detailed Arbitrage Analysis report of the purchase half of an arbitrageur's transaction as would be reported to the arbitrageur.

Figure 6M illustrates a detailed Arbitrage Analysis report of the sales half of an arbitrageur's transaction as would be reported to the arbitrageur.

Figure 6K illustrates an overview Arbitrage Purchase report of the purchase half of an arbitrageur's transaction as would be reported to the arbitrageur. This is for the same purchase half addressed in Figure 6J.

Figure 6L illustrates an overview Arbitrage Sales report of the sales half of an arbitrageur's transaction as would be reported to the arbitrageur. This is for the same purchase half addressed in Figure 6M.

As discussed above, the detailed reports of Figures 6B, 6D, 6G, 6H, 6J and 6M, in addition to depicting notification reports to traders, also demonstrate the type of calculations performed in evaluating the potential trades that were not chosen for actual execution.

2. SETTINGS

This section of the patent is focused on presenting, from the

perspective of each individual trader on ETS, the Global, Exchange, Account and Order level settings. Settings are organized on a per-trader basis, meaning that: i) every trader on ETS accesses his or her own set of settings; and ii) no trader on ETS is permitted to access the settings of another trader.

In considering the figures accompanying the following discussion, please note the following:

i) areas which have been grayed-out cannot be directly edited.

ii) If a pull down option is indicated for a grayed out setting, the setting may be changed only via pull down.

iii) Traders must enter CANCEL or CONFIRM before entering SUBMIT or OUTBOX.

2.1 GLOBAL SETTINGS

Global settings apply to orders across Exchanges and across Accounts.

Figure 2A depicts the following "Budget" settings:

A trader may establish the total budget he is capable of spending for each of the payment terms allowed by ETS. These budgets apply to any orders the trader may enter on any ETS exchange. This budget feature is particularly important under ETS since, as discussed above, a trader may wish to submit simultaneously more orders than he or she has total funds for and allow ETS to pick the combination that provides the greatest total satisfaction (i.e., net price improvement).

Budgets for progressively longer payment terms dynamically update so to never be less than any budget for shorter terms.

The ALL PAYMENT TERMS budget may not be directly edited, and dynamically updates to always equal the budget associated with the longest payment terms allowed by ETS. In one embodiment, as shown, the longest term is a 30-Day budget.

BUDGET REDUCTIONS are effected after each purchase. A purchase reduces the budget for the payment terms of the trade, and all budgets for longer payment terms, by the amount of the budget requirement

factor multiplied by the purchase.

Figure 2B illustrates "Trading Schedule" settings. For each day of the week, traders may determine when trades may be executed on their behalf.

Figure 2C shows "Roster Settings" settings. A trader will see his or her own copy of such a Roster for every Exchange on ETS.

As can be seen, a Roster has one row for every trader that is authorized to trade on the Exchange represented by the Roster. Preferable, the traders are listed in order of their decreasing Activity Rank, which is the number given in the first column of the Roster after the trader names. This Activity Rank column, and its presentation in descending order, is a powerful feature. It allows a trader to quickly ascertain who are the major players on an Exchange.

The columns of the Roster have a two-fold purpose: to allow the trader who is utilizing the Roster to set certain global parameters regarding how he or she would like to interact with the trader who is the subject of a row of the Roster (these are the Roster Settings) and to depict statistics about the conduct of the particular trader who is the subject of a row of the Roster (these are the Roster statistics).

The Roster Settings are as follows:

Traders may set cumulative primary (expandable) and secondary (fixed) credit lines for each other. Credit lines are not restricted to any given exchange, and may therefore be utilized in any exchange. For example, the secondary credit line may be secured, while the primary credit line is not. In such a circumstance, the secondary would typically be utilized first (without a credit risk fee), and exhausted, before the primary credit line (with a credit risk fee) is utilized.

Each trader may also set the following for the valuation of commitments by each contra trader to deliver payment or goods:

Slow payment factor - This allows a trader to compensate for the possibility that the specified trader will not remit payment in a timely manner.

Slow delivery factor - This allows a trader to compensate

for the possibility that the specified trader will not deliver goods in a timely manner.

Credit Risk Factor - This allows a trader to compensate for the possibility that the specified trader will not honor his commitment. This factor is applied to the amount of primary credit line utilization by the specified trader for the trade.

ETS will also compile trailing system-wide Roster statistics on each trader. The following statistics will be provided to all traders, so that they may more easily evaluate each other (in addition to, or instead of, system-wide statistics, it may be desirable to determine exchange specific statistics):

A percentile activity rank (based on that trader's total dollar amount of credit use)

Average Risk Fee, i.e. credit risk fees assessed against that trader, divided by the total amount on which the credit risk fees (including 0% credit risk fees) were calculated, as per trade analysis.

Average Slow-pay Fee, i.e. slow-pay fees assessed against that trader, divided by the total amount on which those fees (including 0% Slow-pay fees) were calculated, as per trade analysis.

Average Slow-delivery Fee, i.e. slow-delivery fees assessed against that trader, divided by the total amount on which those fees (including 0% Slow-delivery fees) were calculated, as per trade analysis.

Figure 2D depicts "Credit Holds" settings. Holds against contra trader credit lines are automatically effected after each trade. Credit Hold settings control the expiration of the credit holds generated by credit use. The trader may set credit holds differently for each combination of payment and delivery terms and methods. All holds begin with the date of the trade and expire as per the credit exposure hold setting.

Holds are set as follows:

For sales (regardless of delivery terms and methods), the expiration of the hold on the buyer's credit is set as the number of days beyond the date of payment.

For immediate delivery purchases, the expiration of the hold on

the seller's credit is set as the number of days beyond the date of the trade.

For deferred delivery purchases, the expiration of the hold on the seller's credit is set as the number of days beyond the date of payment.

Credit Holds are effected against the utilized credit lines, for the amount of the credit required for the trade, for a length of time as determined by the credit hold settings of the parties. Note that due to credit expansion, the amount of credit held may exceed the credit line.

Figure 2E illustrates "Progressive Credit Risk Multiplier" settings.

Because credit risks tend to increase with the length of the credit hold, the trader may modify his risk assessments based on the length of the credit hold. This may be accomplished by setting a credit risk multiplier, defined to equal the multiple of the credit risk associated with a specified credit hold length. That credit risk multiplier will be automatically modified for all other credit hold lengths. Modifiers for those other credit hold lengths will equal 1.0 for a 0 day credit hold, and will increase for longer holds by a constant and compounding daily factor. The compounding factor will be determined by extrapolating from the defined credit risk multiplier. Credit risk multipliers apply equally to all contra traders.

Figure 2F shows "Credit Expansion" settings.

Credit expansion allows traders to automatically exceed (to an unlimited extent) their primary credit lines. However, when a trader exceeds his primary credit line (from the contra trader), the credit expansion settings of the contra trader are used to discount the value (to the contra trader) of his commitment (to remit payment or deliver goods).

Expansion factors apply equally to the primary credit lines of all other traders, but do not apply to secondary credit lines.

Credit expansion factors are defined in a tiered format, with increasing factors charged for greater levels of supplemental credit. (Discounts may not be set lower than that of the previous tier.)

The tier is defined as a % of the credit line, and the discount as a % of the credit expansion.

The lowest tier (0-100%) provides credit in the amount of the primary

credit line, at a discount of 0%. (May not be edited)

The highest tier provides unlimited credit (e.g. 200%-Up), at a discount of 100%. (The tier may not be directly edited. The discount may not be edited.)

The trader may create and edit intermediate tiers (e.g. 100-120%, 120% -135%, etc.).

Figure 2G illustrates "Periodic Order Settings," which operate as follows.

The scheduled time and date of the next test is provided. This indication may not be edited. Redefining the period, however, causes the time of the next test to be automatically rescheduled. For each account, the trader may define the number of periods between tests.

For each account, the number of periods until the next test can be specified. This indication may not be directly edited. After each test, however, regardless of whether or not the given account was included in the test, the number of periods will be reduced by one. If reduced to zero, the number will reset to be equal to the "# of Periods Between Tests" setting.

The trader may checkbox elect "Synchronize Next Test," which will change the "Periods Until Next Test" for all accounts to be equal to one.

If a test is missed due to a system or exchange halt, the test is queued for testing for when the system or exchange halt is lifted. In no case shall more than one periodic test for a given account be placed in the queue. The time of the next test, which shall already have been determined, will not be affected by the time of execution of the queued test.

If a test (for any or all accounts) is executed, but is ineffective due to the trading schedule, an account halt, a closed exchange, or a suspension of the trader, the test will not be queued or rescheduled. The next test, however, will be scheduled in the normal method.

The trader may set the period, i.e. the length of time between automatic tests of periodic orders against the book. The period may be randomly varied by setting a variance greater than 0%. The variance is the amount by which the period will be automatically and randomly varied for the

purpose of rescheduling the next period. For example, with a period of 10 hours and a variance of 10%, after each scheduled period, the time of the next period will be immediately and randomly reset at somewhere between 9-11 hours.

Figure 2H shows "Payment Options" settings. The trader may select from provided options the acceptable methods of payment for purchases and for sales, for various ranges of payment terms.

Figure 2I depicts "Payment Expenses" settings. For each acceptable method of payment, the trader may define the fixed, variable and minimum expenses to be automatically assigned to each trade.

Figure 2J shows the "Currency Discounts" settings, which operate as follows.

The trader must specify his base currency. The base currency is the currency to be used in creating orders and fee settings. This patent is written with the assumption that the dollar is the base currency.

The trader may elect from a list of currencies those that he is willing to accept in payment, and those he is willing to use to remit payment.

For each currency other than the selected base currency, the trader may set a discount at which the currency will be accepted, based preferably on a real-time currency market data feed.

2.2 EXCHANGE SETTINGS

Exchange settings apply to all orders for the particular Exchange in which the setting has been made, and do not apply to orders in any Exchanges other than the Exchange in which it has been set.

Figure 3A depicts the following "Delivery Options" settings. The trader may select from provided options the acceptable methods of delivery for purchases and for sales.

Figure 3B shows the "Handling Fees" settings, which operate as follows.

The trader may set the various (shipping and) handling fees for sales and for purchases. Note that some fees are not applicable when material is

being drop shipped between two other traders.

For each exchange, each trader may set handling fees, for purchases, as follows: per invoice ($), per shipment receiving fee ($) and per unit receiving fee ($).

For each exchange, each trader may set handling fees, for sales, as follows: per invoice ($), per shipment shipping fee ($), per unit shipping fee ($) and insurance (%).

Receiving and shipping fees are "charged" for each shipment. Note that for aggregated trades requiring multiple shipments (one shipment for each combination of addressee and delivery terms), additional fees equalize the increased transaction costs. However, receiving and shipping fees are not "charged" by arbitrageurs when the items are drop shipped by the seller (or another party) to the buyer (or ultimate buyer).

Per invoice fees apply to each party to or from whom payment is due.

Handling fees may be set for each delivery option. (Delivery fees set by exchange or catalog.)

Figure 3C shows the "Brand Discount" settings, which operate as follows.

The trader must specify his preferred brand. The preferred brand is the brand for which that trader's orders on the exchange are based.

The trader may elect from a list of brands that he is willing to accept.

For each brand that he is willing to accept other than the preferred brand:

The average discount demanded or premium paid by all traders on executed trades, as a percentage of order prices, will be provided.

The trader may set a discount or premium at which the brand will be accepted.

2.3 ACCOUNT SETTINGS

Trading accounts are set up by the trader to help organize and control his orders, with each bid and ask assigned to a specified account. The trader may determine his account settings, which apply to all orders in the given

account. The trader may also set up an Arbitrage account, which contains only the instruction (to the system) to automatically execute arbitrage trades for that account whenever possible, as per his arbitrage account settings.

Figure 4A depicts the "Account" settings, which operate as follows.

"ORDER STATUS" allows halts to be manually effected or lifted by the trader. A halt may effect all bids and/or all asks of the Account.

"AUTO-HALT" permits each (non-arbitrage) account the option of automatically deactivating all of the Account's bids after each automatically-matched account purchase, and/or deactivating all of the Account's asks after each automatically-matched account sale. If an Account's bids or asks are halted by the AUTO-HALT feature, the halt may be manually removed by the trader.

The trader may select the "ACCEPTABLE TERMS" for a given Account. For each option allowed by the system operator, the trader may define acceptable payment *methods* (wire, check, e-cash, Visa, etc.) and delivery methods (registered mail, Fedex, etc.) for purchases and sales on various payment and delivery *terms* (e.g. 7-Day Deferred delivery).

The trader may set the following "BID MODIFIER" AND "ASK MODIFIER" settings, which operate in a progressive manner:

(i) modifiers impact all same-side account orders (a "side" being bid or ask) allowing such orders to become more or less competitive (i.e. permute) with changing inventory levels caused by trades executed on the system.

(ii) Tiers for determining when each modifier is to be applied are defined.

(iii) For each tier, a modifier may be set as a premium (+), discount (-).

(iv) The last tier offers the pull down option to "block."

(v) Premiums or discounts apply to the orders executed within that tier. Purchases will reduce the boundaries of all bid modifier tiers and (if applicable) superior account bid modifier tiers by the amount of the bid (or partial bid) executed. Sales will reduce the boundaries of all ask modifier tiers

and (if applicable) superior account ask modifier tiers by the amount of the ask (or partial ask) executed.

(vi) If a bid or ask modifier for one account is subject to the corresponding modifier of another account, the modifiers compound. (E.g. a bid modifier of an inferior account of – 10% will compound with a – 20 % modifier of the superior account, yielding a total discount of 28%. Note that the net superior account discount is only 20%, since it is NOT subject to the inferior account. A superior account modifier set at "blocked" also blocks the inferior account, but not vice versa.)

The "BUDGET REQUIREMENT" settings apply for each combination of payment and delivery terms. The "BUDGET REQUIREMENT" settings allow the trader to define the percentage of the purchase that is subject to his budget for the payment terms. The Budget Requirements grid is defined on one axis by the payment terms of the purchase and on the other axis by the delivery terms of the purchase. (Each factor may be set from 0-100%.)

The "INTEREST RATES" settings apply for Immediate Delivery Purchases as follows. The trader may set interest rates that will be applied to the immediate delivery bid for 0-Day payment terms, generating the immediate delivery bid for the given payment terms. The trader may instead set (this and the following) interest factors for specific amounts and for specified periods on a time line (e.g. for aggregate immediate delivery purchases in the $1-100,000 range, days 1-10 at 12%, days 11-30 at 15%).

The "INTEREST RATES" settings apply for Immediate Delivery Sales as follows. The trader may set interest rates that will be applied to the immediate delivery ask for 0-Day payment terms, generating the immediate delivery ask for the given payment terms.

The "INTEREST RATES" settings apply for Deferred Delivery Purchases as follows. The trader may set an interest rate that will be applied to the deferred delivery bid for 0-Day payment terms, generating the deferred delivery bid for the given payment terms.

The "INTEREST RATES" settings apply for Deferred Delivery Sales as follows. The trader may set an interest rate that will be applied to the

deferred delivery ask for 0-Day payment terms, generating the deferred delivery ask for the given payment terms.

The "DEFERRED DELIVERY DISCOUNT" settings apply for purchases as follows. The percentage discount that will be applied to the (standard delivery) bid for 0-Day payment terms, generating the deferred delivery bid for 0-Day payment terms.

The "DEFERRED DELIVERY DISCOUNT" settings apply for sales as follows. The percentage discount that will be applied to the (standard delivery) ask for 0-Day payment terms, generating the deferred delivery ask for 0-Day payment terms.

The "PROGRESSIVE MINIMUM CREDIT REQUIREMENT," also known as Minimum Credit Requirement Factor (MCRF), settings apply as follows. Some trades involve capital risks lower than the value of the contra trader's commitment. For example, a deferred delivery sale may limit a seller's credit exposure to the buyer to the market risk of the material committed to the buyer. For such trades, the amount of credit required by the contra trader will be calculated via the MCRF.

Because the amount of money at risk tends to increase with the length of the credit hold, the MCRF for each such trade is based on the length of the credit hold. The MCRF may be set for a defined credit hold length greater than 0 days, and will be automatically modified for all other credit hold lengths. For example, if the seller perceives the market risk to equal 10% over 30 days, he may elect to set the 30 day MCRF at 10%.

MCRFs for undefined credit hold lengths will equal 0% for a 0 day credit hold, and will increase for longer holds by a constant and compounding daily factor. The compounding factor will be determined by extrapolating from the defined MCRF. MCRFs apply equally to all contra traders.

"PERIODIC ORDER SETTINGS" include:

(i) The global period (as defined in Periodic Order Settings). (This setting may not be edited through the Account settings screen.)

(ii) The number of periods between tests may be defined for the account.

(iii) The number of periods until the next test will be provided. (This setting may not be edited through the Account settings screen.)

"SUPERIOR ACCOUNTS" settings include the following options:

(i) "Bid Modifier" – If a superior account is designated, the bid modifier for the account will compound with the bid modifier for the superior account, but not vice versa.

(ii) "Ask Modifier" – If a superior account is designated, the ask modifier for the account will compound with the ask modifier for the superior account, but not vice versa.

Figure 4B depicts the "Arbitrage Account" settings, which operate as follows.

The "Arbitrage Account" settings are structured and operate in the same manner as those for non-arbitrage accounts, except as follows.

Because there are no bids and asks for the arbitrage account, the manual inactivation function ("STATUS") is not separated into two options. Inactivation inactivates all trading for the account.

The "ACCEPTABLE TERMS" grid is defined on one axis by the payment terms of the purchase and the other axis as the payment terms of the sale. (Unlike other accounts, delivery is not a consideration for the arbitrage account.)

The arbitrage "BUDGET REQUIREMENT" grid is defined on one axis as the payment terms of the purchase and on the other axis as the payment terms of the sale. This grid is available for editing and review. (Budget requirements may be set from 0-100%.)

The "MARK-UP" settings are utilized as follows. They are the fixed and variable profits required by an Arbitrageur on (the present value of) every arbitrage transaction (comprised of a simultaneous buying and selling), and are the most basic components of the arbitrage spread. Markups are set separately for the trader's standing arbitrage order and for his periodic arbitrage order. (The markup should not be confused with the arbitrage spread, which is based on multiple settings and costs, and may vary from trade to trade.) The arbitrageur's MARK-UP Grid is defined on one axis by

"Standing" and "Periodic" and the other axis as the tiers of purchase size (i.e. present dollar value of each individual purchase). This grid is available for editing and review.

The trader may set the "INTEREST RATES" by which all arbitrage purchases and sales will be valued. (Again, unlike other accounts, delivery is not a consideration for the arbitrage account.)

2.4 ORDER ENTRY SETTINGS

The parameters of an order are as follows:

i) ACCOUNT-- The account to which an order is assigned.

ii) ITEM -- the definition of the item to be traded.

iii) QUANTITY -- The minimum and maximum acceptable quantity.

iv) BID or ASK -- buy or sell side.

v) PRICES -- the prices from which the effective bids and asks (for various payment and delivery terms and methods) will be derived. Prices for a given order may be set for any number of the following:

a) DISPLAYED -- the standing price to be displayed to other traders.

b) HIDDEN -- the standing price to be hidden from other traders.

c) PERIODIC -- the price will only be effective when periodically tested.

d) NOW OR NEVER (NON) -- the price will only be effective when initially submitted.

vi) EXPIRATION (GTC, DAY or Expiration Date) – this parameter is not applicable to the NON price, which by definition expires after the initial test against the book, regardless of the expiration of the order with which it was submitted. (DAY orders expire at a specified time on the current day.)

Figure 5A depicts the order entry settings, which are utilized according to the following discussion.

The "Account" where the order will be kept must be selected.

The "ID #" for the item to be traded must be entered.

For each individual order, enter the "MINIMUM" and "MAXIMUM" "Displayed" quantity, and the "Hidden" MAXIMUM quantity.

Enter the "Expiration" via pull down options (i.e. GTC, DAY or Expiration Date).

Enter the following bids and/or asks:

i) "Displayed" "Standing"

ii) "Hidden" "Standing"

iii) "Periodic"

iv) "Now or Never"

The following Bid and Ask modifier settings will be provided:

i) "CUMULATIVE QUANTITY MODIFIER" allows for the trader to modify his order price as additional pieces are bought (or sold). May be set at a premium or discount.

ii) "LOT SIZE DISCOUNT" allows the trader to increase his bid (discount his ask) by a per-item dollar amount for larger quantities.

iii) For either the "CUMULATIVE QUANTITY MODIFIER" or the "LOT SIZE DISCOUNT":

a) The first tier begins with the minimum quantity for the order and is fixed at a $0 premium (discount).

b) The last tiers end at the (highest) maximum quantity (hidden or displayed) for the order.

c) Discounts may not exceed the order price.

iv) Additional bid modifiers will be provided in some exchanges, as appropriate. For example, for the airline ticket exchange, one might want modifiers for stops, connections, and hours before and after the preferred travel times. Figure 5B depicts an exemplary order modifiers screen for airline ticket bids. In this screen partial hours will be assessed at the hourly rate. Traders have the option to redefine time intervals and add tiers (hours, days).

Price format options vary by exchange, for example:

i) Certified Coin Exchange: Specify by whole dollar amount, or by dollars and cents.

ii) Bullion Coin Exchange: Specify by dollars and cents premium/discount to real time "melt value" (i.e. real time bullion price multiplied by actual gold/silver/platinum weight, plus or minus the fixed premium/discount of the order) or by total dollar value.

As per Figure 5C, additional prices may be added for any order (e.g. a periodic bid price may be added to a bid that previously had only a hidden and displayed bid price).

Unscheduled periodic order sweeps may be conducted with settings as shown in Figure 5D. Each non-arbitrage account is listed. For each, the trader may checkbox elect whether the bids and/or asks of that account should be included as part of the sweep. The trader may also checkbox elect to include the arbitrage account as part of the sweep. The sweep will not change the periodic testing schedule.

The process for transmission and confirmation of trading orders and instructions is as follows. All added or edited trading orders and instructions must be either be confirmed (in one embodiment, by clicking CONFIRM) or canceled (in one embodiment, by clicking CANCEL) by the trader. After a confirmation, the trader must then select SUBMIT, OUTBOX or CANCEL. OUTBOX will send the orders and instructions to the trader's outbox, from which multiple orders and instructions may later be submitted concurrently. The outbox resides on the ETS server. The outbox includes a log of its contents. SUBMIT will send the orders and instructions for immediate processing.

3. EXAMPLE TRADES

The following examples present the fundamental trades that can be conducted on ETS. These examples illustrate the user and system processes involved in utilizing ETS.

For the purpose of these examples, the following three hypothetical traders have been created: Bill Buyer, Sally Seller and Al Arbitrageur. Each trader plays the role suggested by its last name.

Although not completely addressed in the following examples, automatically matched trades are subject to a trader's global, exchange, account and credit settings.

3.1 Example Direct Trade

The following example is referred to as a "direct trade" since ETS is being used to effectuate a commercial transaction directly between buyers and sellers.

Sally decides to sell a coin. Sally Seller creates an ask with the displayed price of $120 and a hidden price of $100, and submits the order to ETS.

ETS attempts to find a matching bid. Once an order is entered, ETS tests it against the book, looking for bids that could satisfy Sally's ask. Let's assume that no such bids exist, so ETS adds Sally's ask to the order book.

Bill decides to buy a coin. Bill Buyer is interested in buying the same coin that Sally has offered. He submits a $120 hidden bid for the coin.

ETS attempts to find a matching ask. ETS begins by searching the book for all potential trades against Bill's bid, the "test order." ETS will attempt to find the best deal available to Bill. The book contains two matches, Sally's $120 displayed ask and her $100 hidden ask. We'll assume, for the purpose of this example, that Sally is the only seller in the market. Matches against other sellers' asks, if present, would also be considered.

Because all orders are subject to certain relevant settings, we must calculate the various "net asks" from Sally to Bill. Assume that Sally has assigned the following settings: for trades with any other trader, a handling fee of $8; for transactions with Bill, a "credit risk factor" of 3% and a slow-pay factor of 1%.

The various prices available to Bill are as follows:

i) Sally's $100 hidden ask is available to Bill at $112.03 for "immediate delivery," 0-Day (i.e. immediate) payment.

ii) Sally's $100 hidden ask is available to Bill at $109.00 for "deferred delivery," 0-Day payment.

"Net Bid" The maximum acceptable purchase price, adjusted for all applicable settings.

"Net Price Improvement" Price improvement less price improvement fees due to Eureka.

"Now or Never Order" Also known as a "NON" order. A NON order is a test order upon its initial submission by the trader who created it. If the NON order does not form a trade, as a result of its initial testing against the order book, the NON order is destroyed.

"Order Book" The database that includes all displayed and hidden orders, as well as arbitrage orders. Bids and asks are ranked (separately), the top rankings going to the highest bid and lowest ask.

"Payment Method" The method by which payment is to be remitted, e.g. check, wire, etc.

"Payment Terms" The number of days the buyer has to remit payment.

"Periodic Order" An "As Is" order that is never placed in the order book. Instead, the order is periodically a test order, and therefore tested against the book, according to a schedule defined by the trader who created the periodic order. A periodic order is not a test order upon being initially submitted, by a trader, to the periodic order file for storage.

"Periodic Order File" A location, separate from the order book, for storing the active periodic orders of a particular exchange, while each order is awaiting its next scheduled testing against the order book. Each exchange has its own periodic order file.

"Period" The average amount of time that passes in between periodic tests.

"Price Improvement" The present value of the difference between a trader's net order price and the modified value received. For an arbitrageur, price improvement is the difference between his required spread and realized spread.

"Price Improvement Fee" The amount charged by ETS to a trader realizing price improvement. Only the test order is eligible for price improvement, so for each automatically matched trade, no matter how many traders are involved in the trade, only one trader is eligible for price improvement. The fee varies by exchange, but is always set at a defined percentage of the trade.

"Standing Order" An order, stored in the order book, which is continuously (and passively) available for being matched with other orders (one of the other orders being a test order) to form a trade.

"Suspension" A (manual or automatic) inactivation of a trader's orders imposed by ETS.

"Test Order" The order that is being tested against the book.

"Trade" A transaction that has been generated by the order matching process or via hit.

"Trader" A registered subscriber. Only traders may view market pages, submit orders and hit orders.

WHAT IS CLAIMED IS:

1. An electronic trading system, comprising:

one or more electronic trading exchanges;

automatic matching; and

a credit roster by which a first trader can set at least one credit line for at least one other trader on the trading system.

2. The electronic trading system of claim 1, further comprising a credit expansion table by which the first trader specifies an amount by which an offer by the at least one other trader, which exceeds the credit line of the at least one other trader, is discounted.

3. The electronic trading system of claim 1, further comprising a minimum credit requirement factor by which a first trader modifies contra-trader credit line utilization for various trades.

4. An electronic trading system, comprising:

one or more electronic trading exchanges;

automatic matching; and

a first risk parameter by which a first trader can specify an amount of discounting to be applied to an offer by at least one other trader on the system.

5. The electronic trading system of claim 4, wherein the first risk parameter is a credit risk parameter.

6. The electronic trading system of claim 4, wherein the first risk parameter is a slow pay parameter.

7. The electronic trading system of claim 4, further comprising a credit risk multiplier by which at least one credit risk parameter is adjusted for varying periods of credit hold time.

8. The electronic trading system of claim 1, further comprising a credit hold table specifying at least one length of time by which an available credit portion, of the credit line, is temporarily reduced, in accordance with trade terms.

9. An electronic trading system, comprising:

one or more electronic trading exchanges;

automatic matching; and

a budget table by which a first trader can set at least one budget for each of at least one payment terms;

10. The electronic trading system of claim 9, wherein the budgets are interrelated.

11. An electronic trading system, comprising:

one or more electronic trading exchanges;

automatic matching; and

at least a first setting by which a first trader can select variable terms the first trader finds acceptable for payment of trades into which the first trader may enter into on the trading system.

12. The electronic trading system of claim 11, further comprising the terms for payment being a number of days.

13. An electronic trading system, comprising:

one or more electronic trading exchanges;

automatic matching; and

at least a first setting by which a first trader can select variable methods the first trader finds acceptable for payment of trades into which the first trader may enter into on the trading system.

14. An electronic trading system, comprising:

one or more electronic trading exchanges;

automatic matching; and

at least a first setting by which a first trader can select variable terms the first trader finds acceptable for delivery of trades into which the first trader may enter into on the trading system.

15. The electronic trading system of claim 14, wherein the acceptable terms for delivery comprise deferred delivery.

16. An electronic trading system, comprising:

one or more electronic trading exchanges;

automatic matching; and

at least a first setting by which a first trader can select variable methods the first trader finds acceptable for delivery of trades into which the first trader may enter into on the trading system.

17. An electronic trading system, comprising:

one or more electronic trading exchanges;

at least a first exchange for trading by automatic matching on which a first trader has placed at least a first order;

at least a second exchange for trading by automatic matching on which the first trader has placed at least a second order; and

a system-wide automatic order matching engine that controls the execution of at least the first and second orders placed by the first trader.

18. The electronic trading system of claim 17, wherein the system-wide automatic order matching engine updates a budget for the first trader based upon which combination of the first and second orders is executed.

19. The electronic trading system of claim 17, wherein the system-wide automatic order matching engine:

identifies the first and second orders as test orders;

determines that either one, but not both, of the first and the second orders can be executed; and

chooses one of the first and second orders for execution depending upon which of the first and second orders provides the maximum present value price improvement to the first trader.

20. The electronic trading system of claim 17, wherein the system-wide automatic order matching engine:

determines that both the first and the second orders are with a same first contra-trader; and

updates a credit-in-use value for the first contra-trader based upon which combination of the first and second orders is executed.

21. The electronic trading system of claim 18, wherein an amount by which the budget is updated is determined by an executed trade amount being multiplied by a budget requirement factor of the first trader.

22. An electronic trading system, comprising:

at least a first exchange for trading by automatic matching; and

a set of system-wide order management tools by which at least a first trader can simultaneously and automatically control his trading activity in all exchanges.

23. An electronic trading system, comprising:

at least a first exchange for trading by automatic matching on which a first trader has placed at least a first order, wherein the first order is comprised of at least a sub-order to sell and a sub-order to buy, wherein the sub-order to sell and the sub-order to buy may be on a same or each on a different exchange; and

a system-wide automatic order matching engine that monitors orders placed by the first trader, wherein the matching system only executes the first

order when it determines that both the sub-order to sell and the sub-order to buy can be executed.

24. The electronic trading system of claim 23, wherein the matching system determines that both the sub-order to sell and the sub-order to buy can be executed if a differential cost of executing the two sub-orders, for the first trader, satisfies a first condition.

25. The electronic trading system of claim 24, wherein the first condition specifies that the differential cost be less than or equal to a monetary amount.

26. An electronic trading system, comprising:

at least a first exchange for trading by automatic matching on which a first trader has placed at least a first order, wherein the first order is comprised of two or more sub-orders, wherein the two or more sub-orders may each be on any exchange; and

an automatic order matching system that controls execution of orders placed by the first trader, wherein the executes system only executes a single sub-order of the first order.

27. An electronic trading system, comprising:

at least a first exchange for trading by automatic matching on which a first trader has placed at least a first order, wherein the first order is comprised of at least a sub-order to sell and at least two sub-orders to buy, wherein the sub-orders may each be on any exchange; and

a system-wide automatic order matching engine that control execution of orders placed by the first trader, wherein the matching system only executes the first order when it determines that both the sub-order to sell and a sub-order to buy can be executed, and wherein only a single sub-order to buy is executed.

28. An electronic trading system, comprising:

at least a first exchange for trading by automatic matching on which a first trader has placed at least a first order, wherein the first order is comprised of at least two sub-orders to sell and at least one sub-order to buy, wherein the sub-orders may each be on any exchange; and

a system-wide automatic order matching engine that controls execution of orders placed by the first trader, wherein the matching system only executes the first order when it determines that both a sub-order to sell and the sub-order to buy can be executed, and wherein only a single sub-order to sell is executed.

29. A method for an automatic order matching engine, comprising the following steps:

identifying a test packet submitted by a trader;

identifying all potential trades enabled by the test packet; and

determining a combination of potential trades which, if executed, would result in a greatest price improvement to the trader submitting the test packet.

30. The method of claim 29, wherein the price improvement is an absolute, present value, aggregate and net price improvement.

31. A method for an automatic order matching engine, comprising the following steps:

identifying a test packet submitted by a trader;

identifying all potential trades enabled by the test packet; and

determining a combination of potential trades which, if executed, would result in a greatest price improvement, according to an approximation technique, to the trader submitting the test packets.

32. The method of claim 31, wherein the approximation technique is an application of one or more heuristics.

33. The method of claim 31, wherein the approximation technique is an application of neural networks.

34. The method of claim 31, wherein the price improvement is an absolute, present value, aggregate and net price improvement.

35. The method of claim 29, wherein the test packet exclusively consists of those periodic orders belonging to accounts scheduled to be tested in a current period.

36. The method of claim 31, wherein the test packet exclusively consists of those periodic orders selected by a trader for inclusion in a periodic order sweep

37. An electronic trading system, comprising:
one or more electronic trading exchanges;
automatic matching; and
an order book containing both displayed and hidden standing orders.

38. The electronic trading system of claim 37, further comprising:
at least one periodic order.

39. The electronic trading system of claim 37, further comprising:
at least one now or never order.

40. The method of claim 29, wherein the combination of trades will result in an execution of a test order against an aggregation of two or more contra-orders.

41. The method of claim 29, wherein the combination of trades will result in an execution of a test order and at least one other same-side book order against one or more contra-orders.

42. The method of claim 31, wherein the combination of trades will result in an execution of a test order against an aggregation of two or more contra-orders.

43. The method of claim 31, wherein the combination of trades will result in an execution of a test order and at least one other same-side book order against one or more contra-orders.

44. The method of claim 29, wherein the combination of trades will include at least one test order matched against an arbitrage order.

45. The method of claim 31, wherein the combination of trades will include at least one test order matched against an arbitrage order.

46. The method of claim 29, wherein the test packet includes an arbitrage order.

47. The method of claim 31, wherein the test packet includes an arbitrage order.

48. An electronic trading system, comprising:

one or more electronic trading exchanges;

a system-wide automatic order matching engine; and

one or more modifiers by which a trader can create rules by which the system-wide automatic order matching engine creates one or more permutations of at least a first order.

49. The electronic trading system of claim 48, wherein the one or more modifiers comprise one or more interest rates by which prices for various payment terms are permuted.

50. The electronic trading system of claim 48, wherein the one or more modifiers comprise one or more lot size modifiers by which prices for trades of various lot sizes are permuted.

51. The electronic trading system of claim 48, wherein the one or more modifiers comprise one or more cummulative quantity modifiers by which prices for trades of increasing cummulative quantity are permuted.

52. The electronic trading system of claim 48, wherein the one or more modifiers comprise one or more progressive order execution modifiers by which orders permute as a result of changing inventory levels caused by trades executed on the system.

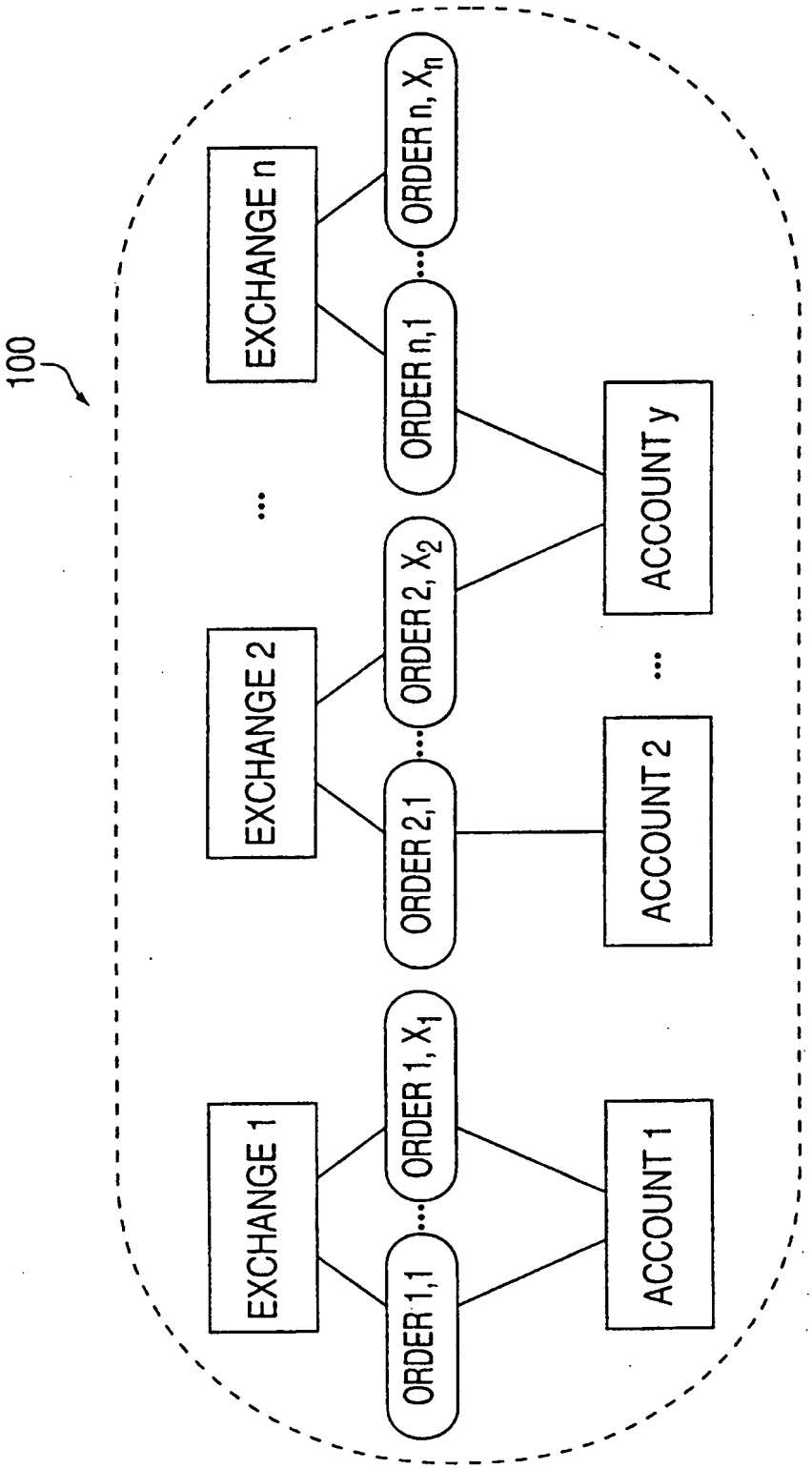

100
EXCHANGE 1
EXCHANGE 2
EXCHANGE n
ORDER 1,1
ORDER 1, X1
ORDER 2,1
ORDER 2, X2
ORDER n,1
ORDER n, Xn
ACCOUNT 1
ACCOUNT 2
ACCOUNT y

FIG.1A

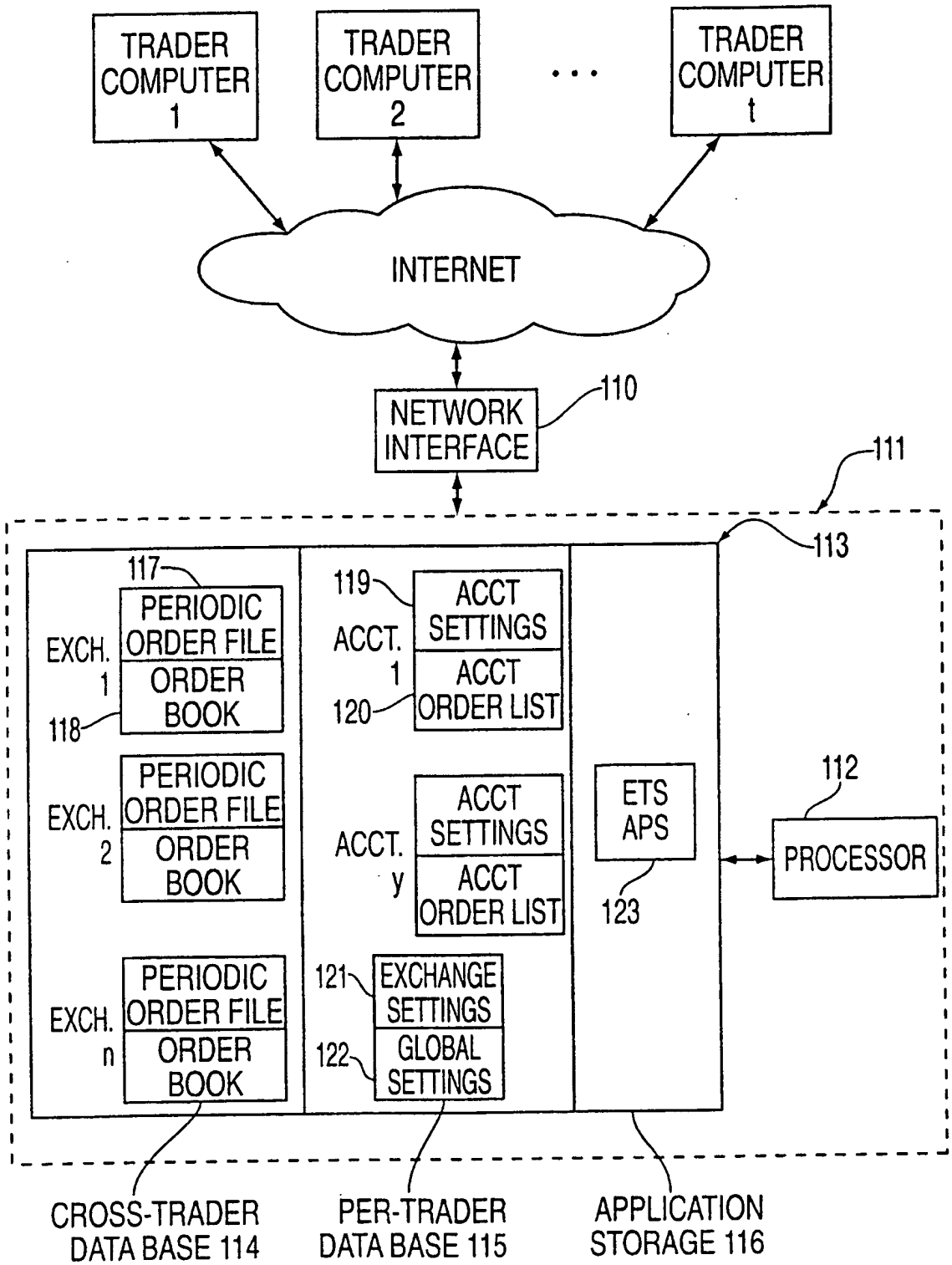
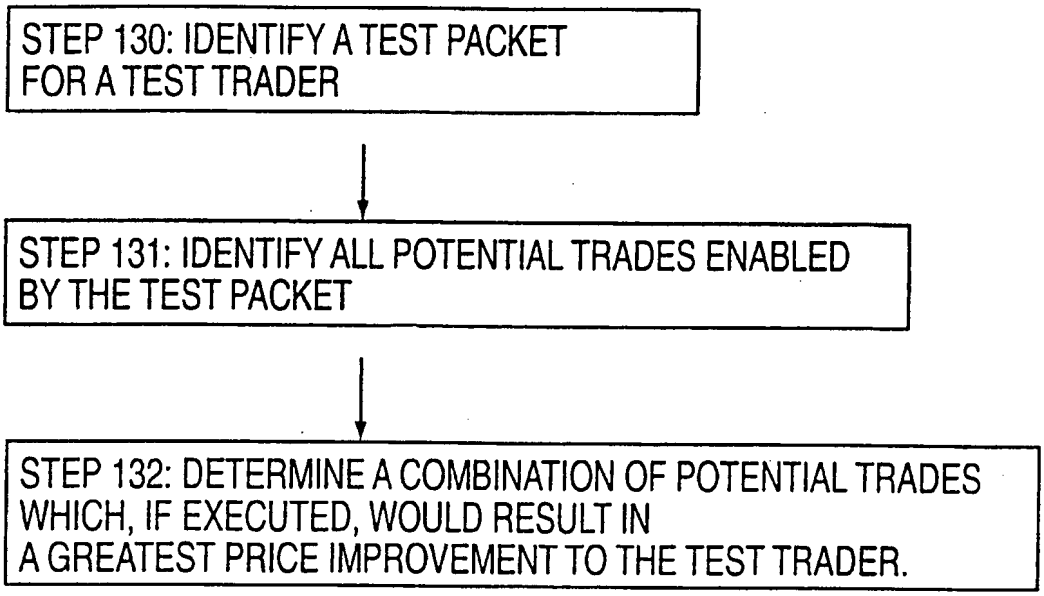

TRADER COMPUTER 1
TRADER COMPUTER 2
TRADER COMPUTER t
INTERNET
NETWORK INTERFACE
110
111
113
117
PERIODIC ORDER FILE
EXCH. 1
ORDER BOOK
118
PERIODIC ORDER FILE
EXCH. 2
ORDER BOOK
PERIODIC ORDER FILE
EXCH. n
ORDER BOOK
119
ACCT SETTINGS
ACCT. 1
ACCT ORDER LIST
120
ACCT SETTINGS
ACCT. y
ACCT ORDER LIST
121
EXCHANGE SETTINGS
122
GLOBAL SETTINGS
ETS APS
123
112
PROCESSOR
CROSS-TRADER DATA BASE 114
PER-TRADER DATA BASE 115
APPLICATION STORAGE 116

FIG. 1B



AUTOMATIC ORDER MATCHING ENGINE METHOD

FIG. 1C

STEP 140: INITIALIZE TOTAL PRICE IMPROVEMENT FOR A COMBINATION OF POTENTIAL TRADES TO ZERO

STEP 141: LOOP FOR EACH CURRENT POTENTIAL TRADE OF THE COMBINATION OF POTENTIAL TRADES:

STEP 142: DETERMINE CURRENT TEST ORDER OF CURRENT POTENTIAL TRADE

STEP 143: DETERMINE CURRENT PRICE IMPROVEMENT TO CURRENT TEST ORDER OF CURRENT POTENTIAL TRADE.

STEP 144: ACCUMULATE CURRENT PRICE IMPROVEMENT FOR CURRENT TEST ORDER TO TOTAL PRICE IMPROVEMENT FOR THE COMBINATION OF POTENTIAL TRADES.

STEP 145: END LOOP

(PSEUDO-CODE)

FIG. 1D

iii) Sally's $120 displayed ask is available to Bill at $132.84 for immediate delivery, 0-Day payment.

iv) Sally's $120 displayed ask is available to Bill at $129.20 for deferred delivery, 0-Day payment.

v) Sally's asks for 7 and 30-Day "payment terms" will be calculated according to her interest rate settings for sales.

Just as we calculated Sally's net asks, we will calculate Bill's "net bids" (to Sally) for various terms. To keep this example simple, let's assume that Bill's only net bids (to Sally) are $120 for immediate delivery and $108 for deferred delivery, 0-Day payment terms.

Because Bill's bid is the test order, he is entitled to the best available deal, which is not necessarily the lowest price. To determine the best deal, we calculate the net price improvement (i.e. savings) to Bill, based on his net bids and Sally's net asks. The most advantageous trade available to Bill (i.e. the deal that provides the greatest absolute present value price improvement) will be executed, subject to the following:

i) Bill's "budget" must not be exceeded.

ii) The present value of Bill's price improvement (i.e. his net bid minus Sally's net ask) must equal or exceed the price improvement fee which he will owe to ETS.

In this case, assume that Bill's best available deal was Sally's net ask of $112.03, for a savings of $7.97. Having received price improvement, Bill will pay to ETS a price improvement fee of 0.25% of the $112.03 trade price, $0.28. Bill's "Net Price Improvement" (or NPI) is $7.69 (i.e., $7.97 - $0.28).

ETS notifies the traders of the successful trade. Once a trade is executed, ETS notifies the traders. Sally receives a Sales Notification and Bill receives a Purchase Notification.

Sally and Bill complete the trade. ETS's role in this trade is over. It is left up to Sally and Bill to perform the trade as per the terms specified in the trade reports.

3.2 Example Direct Trade

In the previous example, Sally learned that there are disadvantages to placing an order on the book. Most importantly, if a hidden or displayed order is not executed when tested against the book, it will become a "sitting duck" with no chance at price improvement.

To address this concern, we also allow traders to place "periodic orders." The periodic order will not be immediately tested against the book, but instead will be added to the periodic order file. Once filed, the order will be repeatedly tested against the book, as per the trader's periodic order settings.

In this way, the periodic order is always the test order, and will always receive any available price improvement. It should be stressed, however, that a periodic order is ineffective except when being tested against the book.

Sally decides to sell a coin. This time, Sally submits a $120 displayed ask and a $100 periodic ask.

ETS attempts to find a matching bid. ETS tries to match the $120 ask against the book. The highest bid on the book is $110, so no trade can be executed at this time. The displayed ask of $120 is placed on the book. The $100 periodic ask is placed in the periodic order file, scheduled to be tested against the book once an hour, until the order is filled, deleted or expired.

Bill decides to buy a coin. Bill submits a $115 bid.

ETS attempts to find a matching ask. ETS tries to match the $115 bid against the book. The lowest ask on the book is Sally's displayed ask of $120, so no trade can be executed at this time. Therefore, Bill's bid is placed on the book.

ETS attempts to match Sally's periodic orders. The next automatic attempt to match Sally's orders against the book finds Bill's bid of $115. Sally's periodic ask of $100 is matched against Bill's bid. The matching process is similar to the previous example, except that Sally's periodic ask is the test order. Therefore, she will receive the benefit of any available price improvement.

3.3 EXAMPLE AUTOMATICALLY MATCHED ARBITRAGE TRADE

The arbitrage function allows the trader to automatically buy and simultaneously sell the items purchased at a profit, whenever the opportunity arises. Note that the arbitrageur cannot buy on deferred delivery and sell for deferred delivery, unless the hold on the seller's credit (even if for $0) would expire on or before the buyer's payment due date. In some cases, an arbitrage order will bridge bids and asks for two (or more) different payment terms, payment methods, payment currencies and/or delivery methods.

The arbitrageur will define via the arbitrage settings page the conditions of his arbitrage order, which include the arbitrage markup, interest rates and various other factors. The interest rate factor for his purchase will be subtracted from his arbitrage spread, and the interest factor for his sale will be added to his spread. In effect, the longer the arbitrageur has to pay for his purchase, the smaller his spread, and the longer he has to wait for payment from the buyer, the higher his spread. To keep the following example as simple as possible, it will be assumed that the optimal trades will occur on 0-Day payment terms, so the interest rates will not be an issue.

Like any other order, the arbitrage order can only receive price improvement when tested against the book. Once the arbitrage order is on the book, it will not be eligible for price improvement, and will only become involved in a trade when it provides the best deal for the test order(s).

For the same reasons that we enable periodic bids and asks, we also allow the trader to set a periodic arbitrage markup, which function similarly to other periodic orders.

The arbitrageur will always be responsible for an arbitrage fee due to ETS, but will only be charged a price improvement fee when he receives price improvement.

In this example, we will extend Example 2.1 by introducing the trader Al Arbitrageur. In the past, Sally has had problems collecting payment from Bill. Subsequently, she set credit risk and slow-pay factors for Bill. If Bill is to buy directly from Sally, he will have to pay a significant premium. On the other hand, Sally has never had a problem with Al, so she has set his credit risk and slow-pay factors at 0%. Al's ability to buy from Sally at a cheaper

price than Bill may lead to an automatically matched arbitrage trade.

Al submits an arbitrage order. He sets a markup of 1%.

ETS attempts to find arbitrage opportunities for Al. Several arbitrage opportunities are identified.

ETS automatically executes arbitrage trades on Al's behalf. Because Al's arbitrage order is the test order, ETS will rank and execute those trades that maximize Al's satisfaction, as per his arbitrage settings. Al is entitled to any available price improvement, i.e. profits in excess of the sum of his requirements and any arbitrage fees due to ETS. Therefore, the trades take place at the net bid and ask levels set by the traders whose orders have been arbitraged. Only Al receives price improvement, and therefore only Al is assessed a price improvement fee. The fee is based on Al's selling price.

Al's arbitrage order is placed on the book.

Sally decides to sell a coin. As before, Sally submits a $100 hidden ask for her coin.

ETS attempts to find a matching bid. As before, no matching bids exist, so Sally's ask is added to the book.

Bill decides to buy a coin. As before, Bill bids $120. Bill's bid is now the test order.

ETS attempts to find a matching ask. The matching process always examines all potential trades, including arbitraged trades, in its search for the "best deal" for Bill. As previously shown, Bill's best deal available directly from Sally is her $112.03 net ask. The trade will be executed directly between Bill and Sally at $112.03 unless an Arbitrageur can increase Bill's net price improvement.

If Al can earn his required arbitrage spread, and at the same time provide Bill with greater net price improvement, the orders will be matched through Al. Because Al's credit risk and slow-pay factors for Bill are both set at 0%, he can provide additional net price improvement to Bill. Al is able to buy Sally's coin at her hidden ask, plus her handling fee, for a total of $108. Al's arbitrage markup is 1%, so he is able to simultaneously buy the coin from Sally at $108 and sell it to Bill at $109.08. Because Bill received price

improvement, he will owe ETS a price improvement fee of $0.27 (i.e., 109.08 * 0.25%), thereby making his total cost $109.35.

ETS notifies the traders of the successful trade. Once a trade is executed, ETS notifies the traders. Sally receives a Sales Notification and Bill receives a Purchase Notification. Al receives an Arbitrage Notification.

Sally, Al and Bill complete the trade. ETS' role in this trade is over. It is left up to Sally, Al and Bill to perform the trades as per the terms specified in the trade reports. Bill and Sally will have no contact with or obligations to each other, although in some cases Sally will be instructed to drop ship the coins to Bill.

3.4 EXAMPLE AUTOMATICALLY MATCHED AGGREGATED TRADES

Sally decides to sell a coin. As before, Sally submits a $100 hidden ask for her coin.

ETS attempts to find a matching bid. As before, no matching bids exist, so Sally's ask is added to the book.

Bill decides to buy a coin. As before, Bill bids $120, but he requires a minimum quantity of two pieces.

ETS attempts to find a matching ask. Sally is the only seller on the book, and she only has one coin for sale. No match exists, so Bill's bid is added to the book.

Sally's sister, Susie Seller decides to sell her coin. Susie also submits a $100 hidden ask for her coin.

ETS attempts to find a matching bid. As her sister could have told her, there are no buyers for just one coin. ETS, however, will aggregate the sisters' orders, providing Bill with his minimum quantity of two coins. Bill was on the book, so he can't get price improvement. He must pay $240 for the two coins, but will pay a different price to each sister. Sally receives $100, since she was also on the book and can therefore not receive price improvement. Susie gets $140, i.e. the balance of Bill's $240, realizing $40 price improvement. (Note that under an in an alternative scenario, if Sally's

ask had been $140, the aggregation would still have taken place, but the prices paid to each sister would be reversed.) Susie will pay a price improvement fee to Eureka based on the aggregate value of the trades, i.e. $240.

ETS notifies the traders of the successful trade. After the trades are executed, ETS notifies the traders. Sally and Susie each receive a Sale Notification. Bill receives an Aggregated Purchase Notification.

Sally, Susie and Bill complete the trades. ETS' role in this execution is over. It is left up to Sally, Susie and Bill to perform the trades as per the terms specified in the trade reports.

3.5 EXAMPLE MANUAL PERIODIC SWEEP

Bill creates, at various times, a number of periodic orders. Those not filled, deleted or expired remain in the periodic order file until expiration.

Bill gets aggressive. His periodic orders are more competitive than his standing orders, so he instructs ETS to test all of his periodic orders against the book immediately.

ETS attempts to execute trades. His periodic orders are simultaneously tested against the book. The combination of trades that provide maximum net present value price improvement to Bill are executed.

Bill's unfilled periodic orders are returned to the periodic order file. The pre-existing schedule for re-testing will be unaffected.

4. MARKET SCREENS

A "Market Screen" is depicted in Figure 7. Market Screens are maintained by ETS for each catalog item. Each provides a limited view of the market for the item and is visible to all traders.

The item (or sub-category) ID # and description will be provided.

The date and time that the information was compiled will be specified. The "Exchange Hours" stoplight will indicate if the exchange is open, according to the hours of operation defined by ETS for the particular

exchange.

The minimum and maximum quantities for the viewing trader's orders (as set by the viewing trader) will be shown. Additionally:

(i) If the maximum (set) quantity equals the maximum effective quantity, then the order will appear in green.

(ii) If the maximum (set) quantity is greater than the maximum effective quantity, but the maximum effective quantity is greater than or equal to the minimum (set) quantity, then the order will appear in yellow.

(iii) If the minimum (set) quantity is greater than the maximum effective quantity, then the order will appear in red.

Other traders' orders will be shown at the minimum to maximum effective quantity.

The "effective maximum quantity" is defined to be the lower of the set maximum or the greatest quantity that can be traded based on the trader's own global and account settings. If the trader is halted or suspended, his effective quantities are zero. If the exchange or system is halted or closed, his effective quantities are unaffected.

When the screen is formatted to show whole dollar prices, bids will be shown rounded down and asks rounded up.

An alternative version of the market screen shows the trader's own orders, and other traders' orders modified to reflect the effective price and quantities available to the viewing trader. The system operator may elect whether or not other traders' orders will be adjusted (for display purposes) as per the relevant settings. If the system operator elects not to adjust orders for each viewer, the trader reviewing the market page cannot be certain that a displayed order is actually available to him at that price, or at any price.

Pages contain:

(i) Other traders' displayed bids and asks with effective maximum quantities greater than or equal to 1.

(ii) The viewing trader's hidden, displayed and periodic bids and asks for all terms acceptable to the viewing trader for that order.

Orders for the given item (or sub-category) ID# will be ranked (highest

bids and lowest asks closest to center horizontal line) as per the displayed price.

Considerations in using the market screen are as follows.

Dragging the cursor over an order brings up a pop up window containing the following:

(i) The order price

(ii) Quantity Range, as follows:

(a) (If the trader's own order) The quantity range of the order, as set.

(b) The effective quantity range. (If zero, "Inactive")

(iii) (If the trader's own order) The expiration (GTC or Expiration date. If a DAY order, or if an expiration date is specified, specify the date and note "midnight".)

(iv) (If the trader's own order) Displayed, Hidden, or Periodic

(v) Payment terms

(vi) (If the trader's own order) Account ID

(vii) (If another trader's order) Trader ID

Double clicking on your own order will provide the EDIT ORDERS WINDOW, which will include the bids and asks entered for the item # (matching qualifiers, if any) for the account of the selected order.

While the invention has been described in conjunction with specific embodiments, it is evident that many alternatives, modifications and variations will be apparent to those skilled in the art in light of the foregoing description. Accordingly, it is intended to embrace all such alternatives, modifications and variations as fall within the spirit and scope of the appended claims and equivalents.

Appendix 1:

Glossary

Each term defined in this glossary is enclosed in double quotes and is followed by the definition.

"Account" Each trader may create multiple accounts in which he may place his orders.

"Aggregation" The process by which multiple orders of various traders are combined to satisfy the minimum quantity requirements of the traders.

"Arbitrage" The automated and simultaneous purchase and sale of merchandise.

"Arbitrage Spread" The difference between the arbitrageur's purchase price and sale price.

"Ask" The sell order.

"Bid" The buy order.

"Budget" The maximum that a trader is willing to spend for defined payment terms. May be effectively boosted by budget requirement factors below 100%.

"Catalog" The tiered index of item ID numbers and descriptions.

"Contra" The other side to a match or trade. A bid is contra to an ask, and vice versa. The buyer is contra to the seller, and vice versa.

"Credit expansion" A setting by which the trader may allow all other traders to proportionally exceed their primary credit lines. The trader may set factors by which the contra trader's commitment to deliver payment or goods will be discounted, based on the amount of credit required and the extent to which the primary credit line has been exceeded. The discount only applies to that amount of credit that exceeds the available primary and secondary credit lines, within the defined parameters.

"Credit risk Factor" A factor by which the contra trader's commitment to deliver payment or goods will be discounted. The price adjustment is based on the amount of credit required.

"Deferred Delivery" Terms that require the seller to ship the merchandise only upon receipt of good funds.

"Delivery Terms". The terms by which the merchandise is to be delivered to the buyer. (See **Immediate Delivery and Deferred Delivery**)

"Displayed Order" An order whose price is intended to be visible to all traders (on their market pages). Displayed orders are not visible to other traders when ineffective or inactive for any reason. A displayed order is a test order when first submitted by a trader but, if it is initially unmatched, it becomes a standing order on the order book.

"Drop Ship" Shipped by the seller to someone other than the buyer or shipped to the buyer from someone other than the seller. (Only applicable to arbitrage trades)

"Effective Quantity Range" That part of an order that could be executed at the given time, given a willing contra trader.

"Exchange" A group of markets for a class of merchandise, e.g. Certified Coins. Each exchange comprises its own order book and its own periodic order file.

"Exchange Bid Modifier" Settings created by the trader applicable to all bids for items traded in the exchange, usually based on brand. (e.g. discount USAir plane tickets for all bids/itineraries by 8%).

"Execution" The process whereby Eureka puts a buyer and seller together.

"Global" Applicable to all accounts and exchanges.

"GTC" Good Till Canceled.

"Halt" A (manually or automatically) self-imposed inactivation of one's own orders, or an unscheduled inactivation of all exchange or system trading imposed by ETS.

"Hidden Order" An order whose price is intended to be not visible to all traders (on any market pages), except for the trader who created the hidden order. A hidden order is a test order when first submitted by a trader but, if it is initially unmatched, it becomes a standing order on the order book.

"Immediate Delivery" Shipment is required within 48 hours of the trade.

"Item ID" The catalog number for the given item.

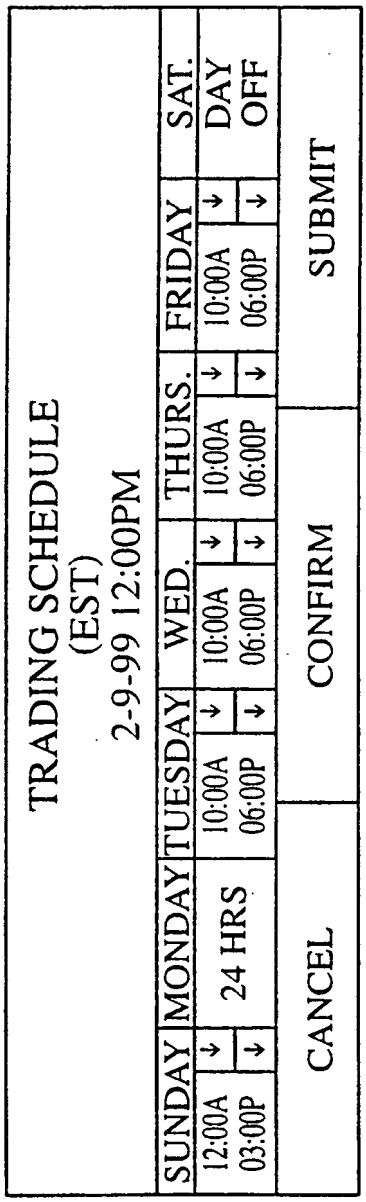
"Match" A potential trade, as discovered in the order matching process.

"Net Ask" The minimum acceptable selling price, adjusted for all applicable settings.

BUDGET 01-29-99 12:00 PM			
PAYMENT TERMS (days)		BUDGET	
0			$100,000.00
7			200,000.00
30			500,000.00
ALL			$500,000.00
CANCEL	CONFIRM	OUTBOX	SUBMIT

(GLOBAL LEVEL)

FIG. 2A



(GLOBAL LEVEL)
FIG. 2B

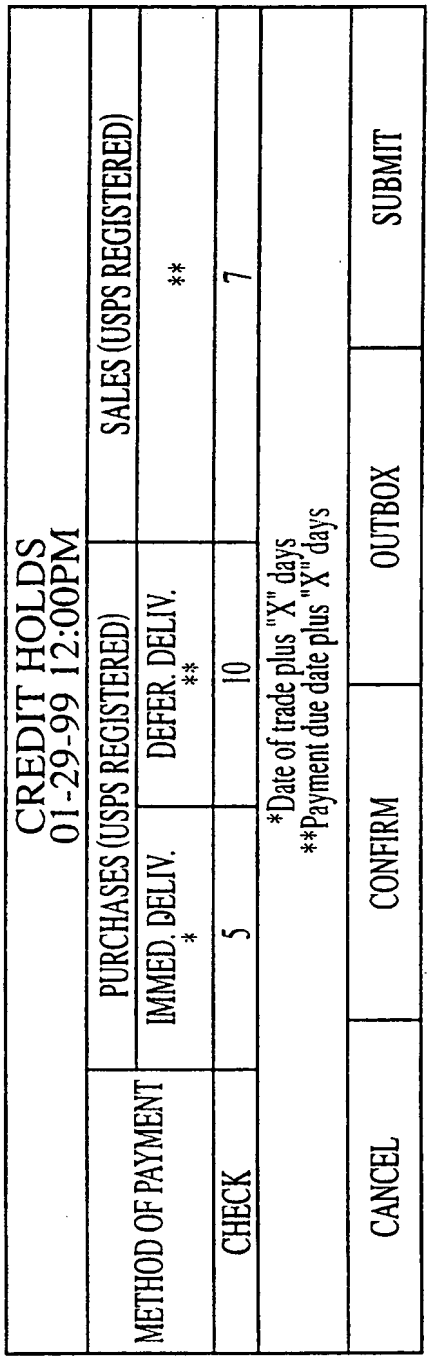
ROSTER SETTINGS
01-29-99 12:00 PM

TRADER			CREDIT			PERFORMANCE							
		Activity Rank	Primary Credit Line	Secondary Credit Line	Credit In Use	Credit Risk	Average Credit Risk Cost	Slow Pay	Average Slow Pay Cost	Slow Delivery	Average Slow Delivery Cost		
DEFAULT		N/A	$100,000.0 ↓	0.00 ↓	N/A	1.00% ↓	NA	AVG. ↓	NA	0.15% ↓	NA		
KEV	Kevin Lipton	69	$500,000.0 ↓	0.00 ↓	$50,000.0	AVG. ↓	0.53%	2.00% ↓	2.15%	0.00% ↓	2.15%	⇧	
JLC	Jeff Isaac Coins	46	$100,000.0 ↓	0.00 ↓	42,500.0	1.15% ↓	1.45%	Default ↓	0.95%	Default ↓	0.95%		
ALC	Andy Lustig	44	PENDING ↓	0.00 ↓	0.0	0.00% ↓	0.01%	2.50% ↓	2.00%	Default ↓	2.00%		
GTC	Gary Tancer	31	PENDING ↓	0.00 ↓	12,000.0	Default ↓	1.04%	4.00% ↓	5.00%	2.00% ↓	1.00%		
JLC	Numismania	2	$100,000.0 ↓	$200,000.00 ↓	$12,000.0	27.15% ↓	14.15%	15.75% ↓	9.40%	5.00% ↓	4.07%	⇩	

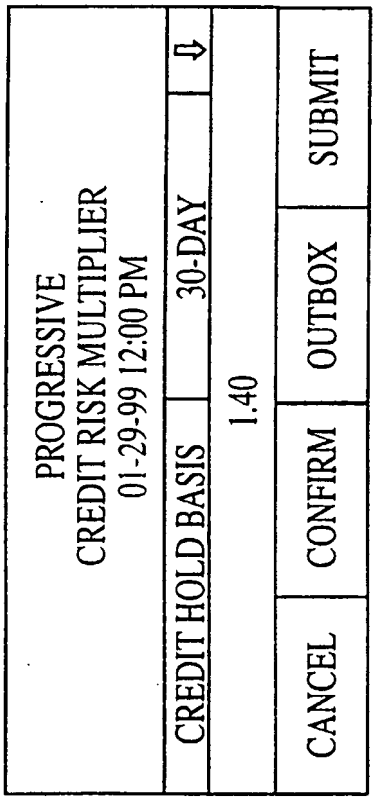
CANCEL | CONFIRM | OUTBOX | SUBMIT

(GLOBAL LEVEL)

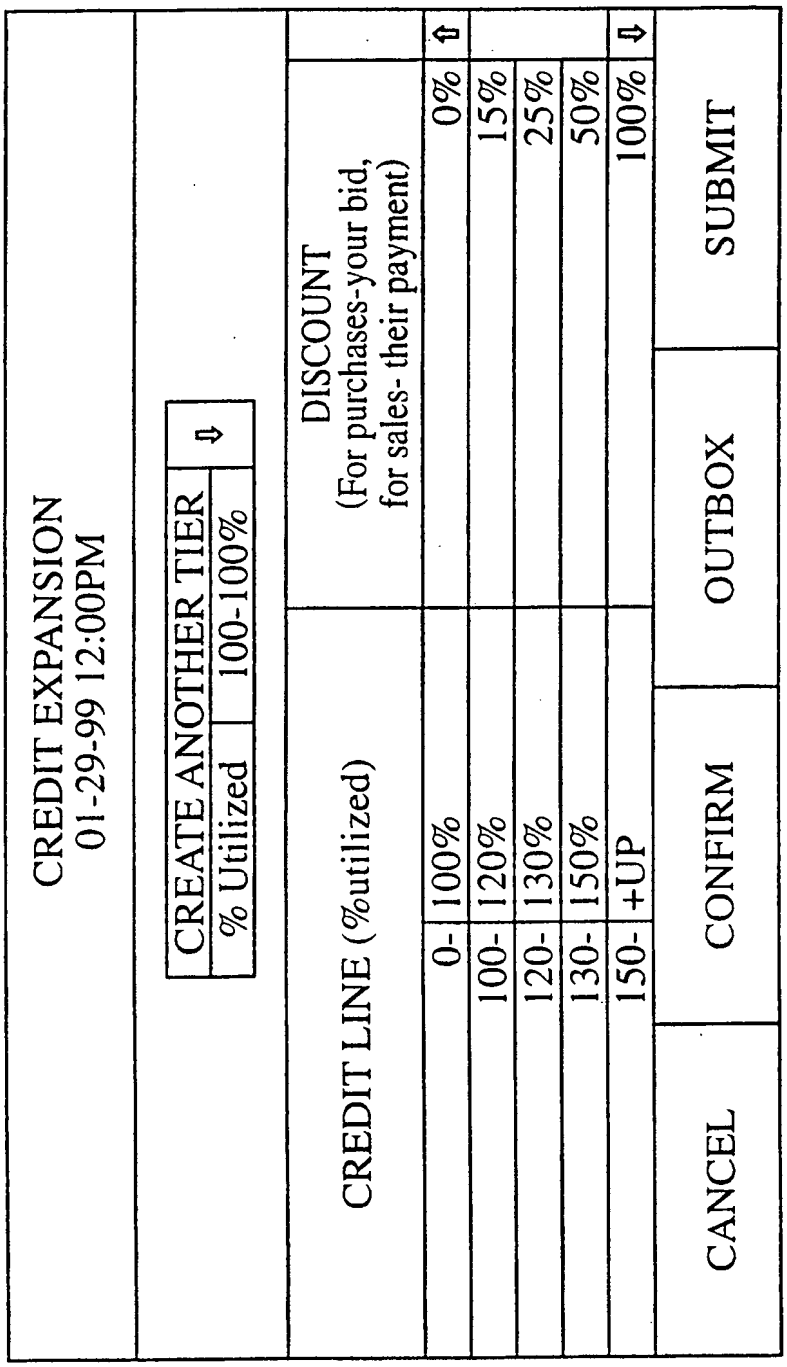
FIG. 2C



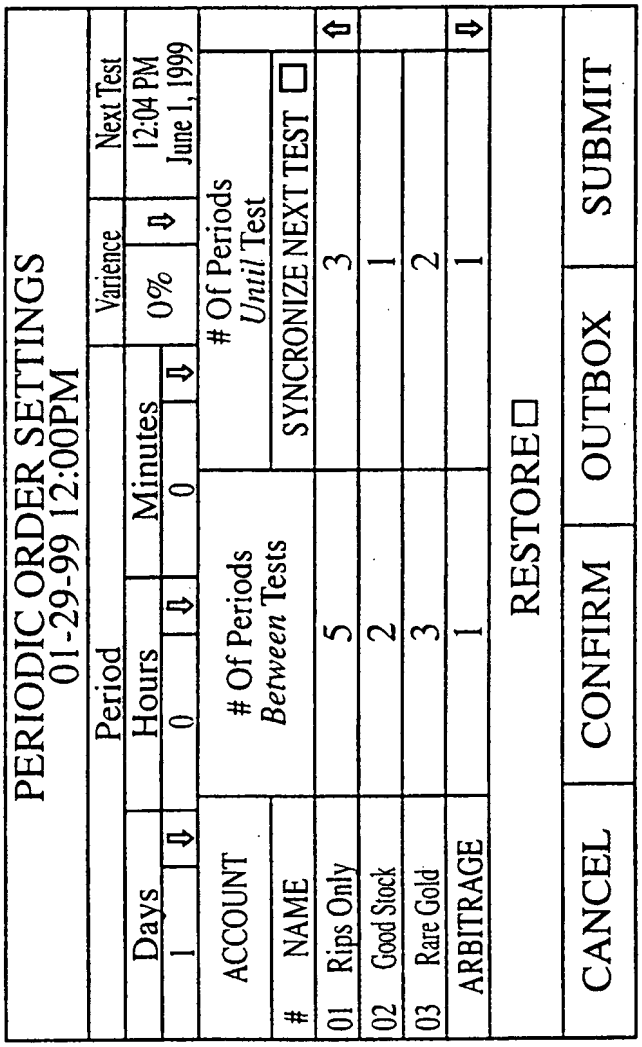
(GLOBAL LEVEL)
FIG. 2D



(GLOBAL LEVEL)
FIG. 2E

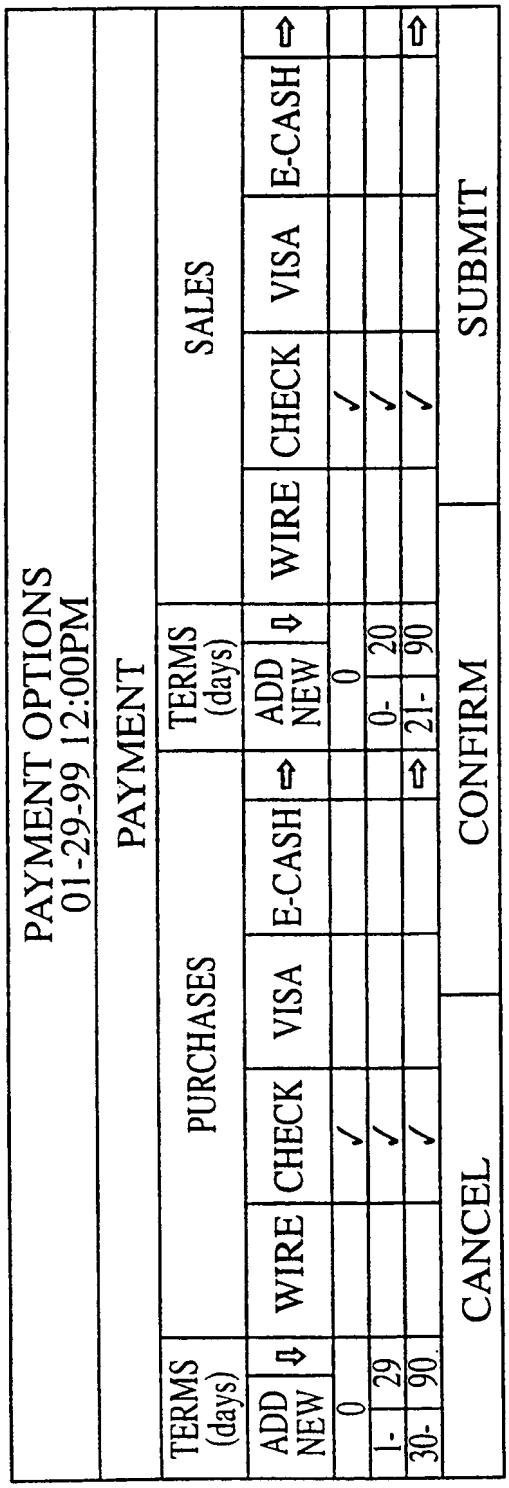


(GLOBAL LEVEL)
FIG. 2F



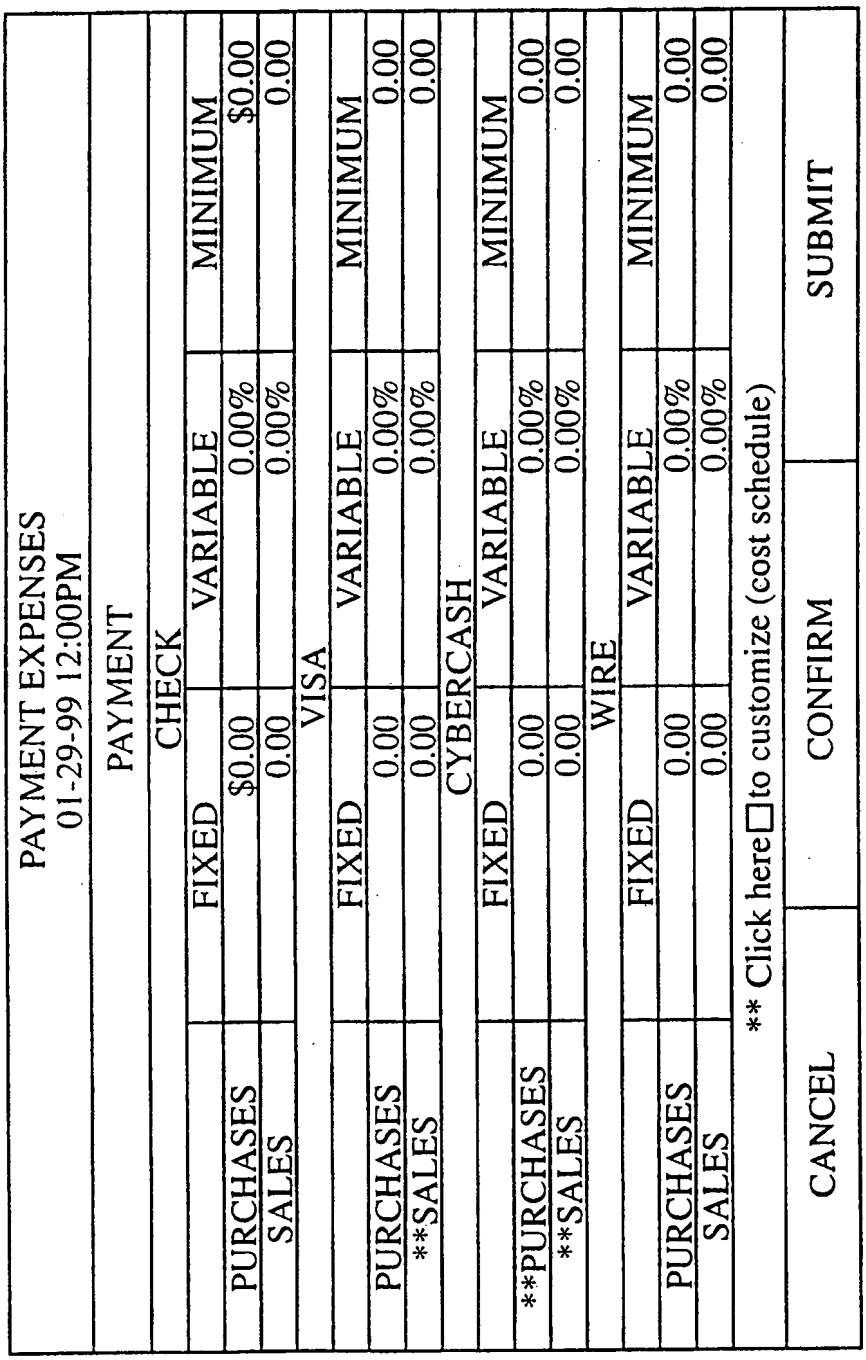
(GLOBAL LEVEL)

FIG. 2G

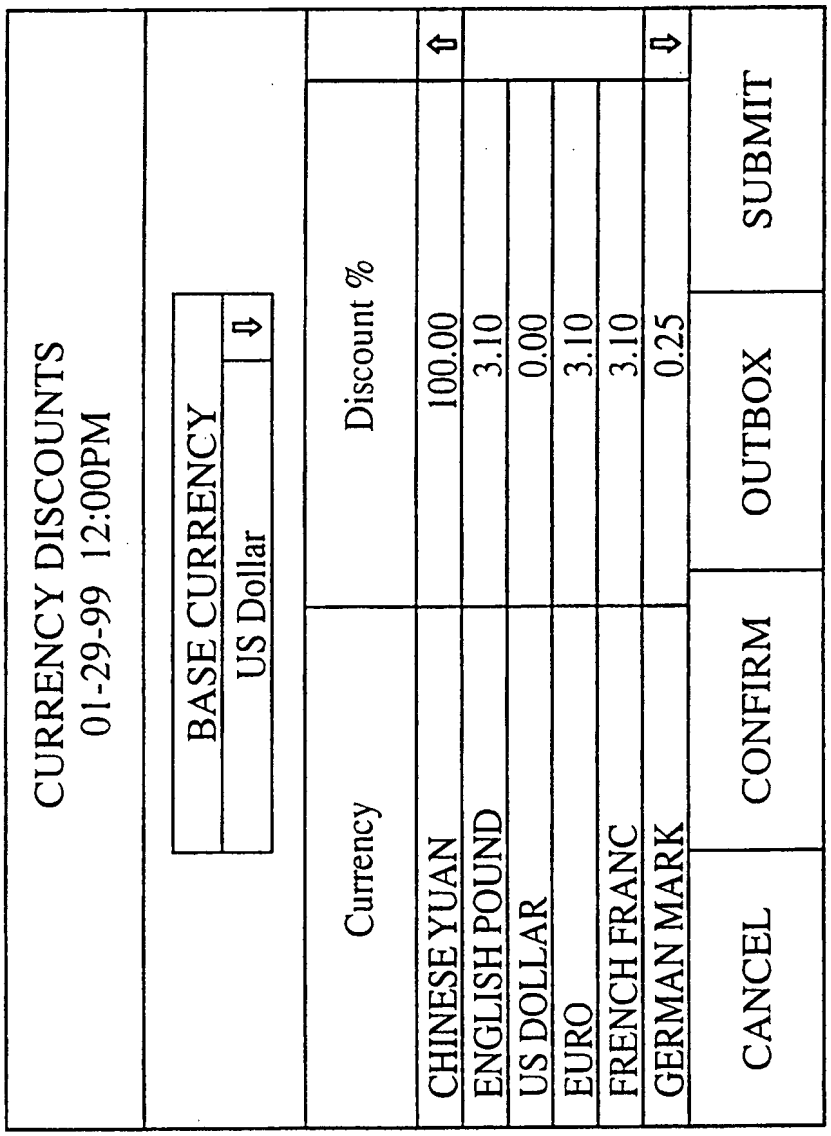


(GLOBAL LEVEL)

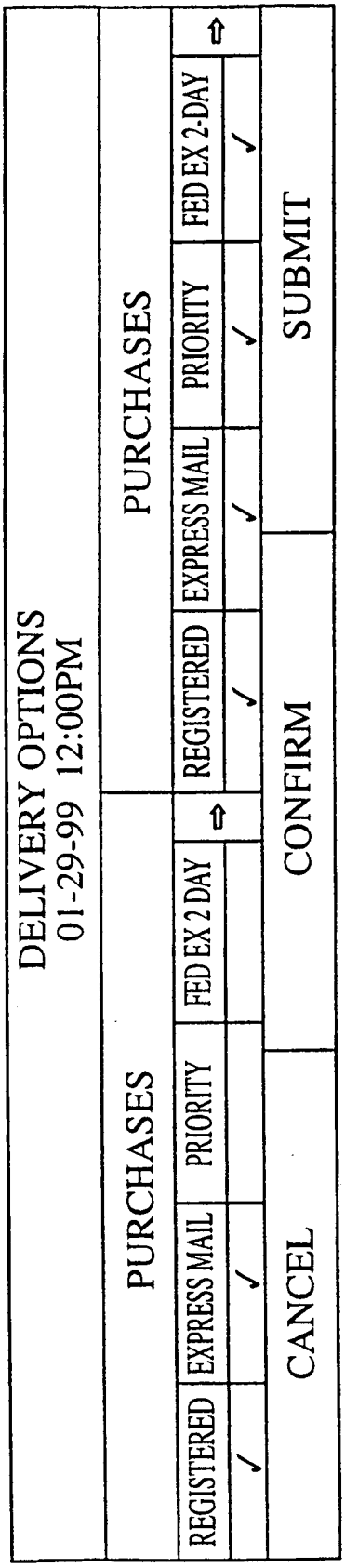
FIG. 2H



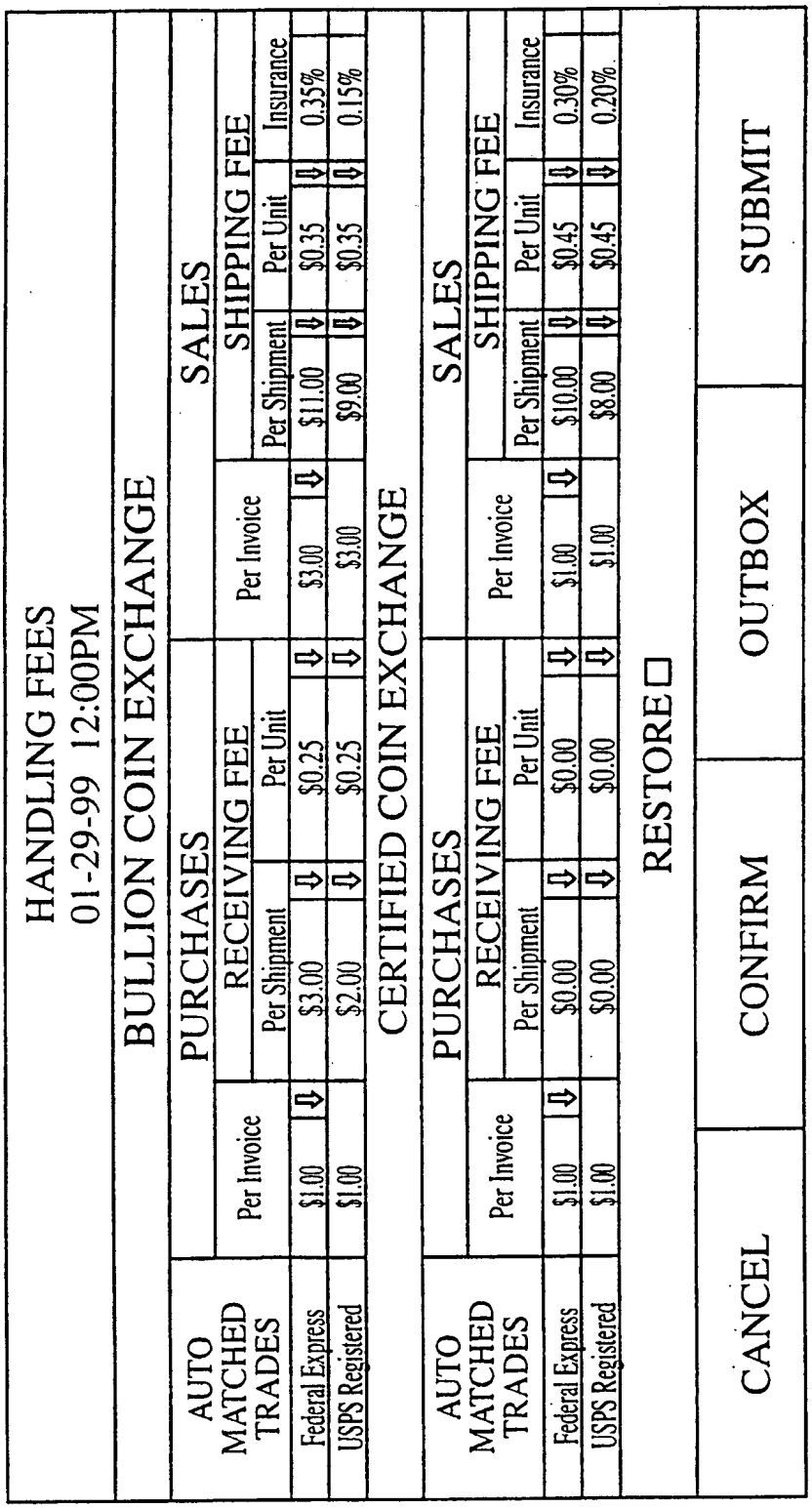
(GLOBAL LEVEL)
FIG. 21



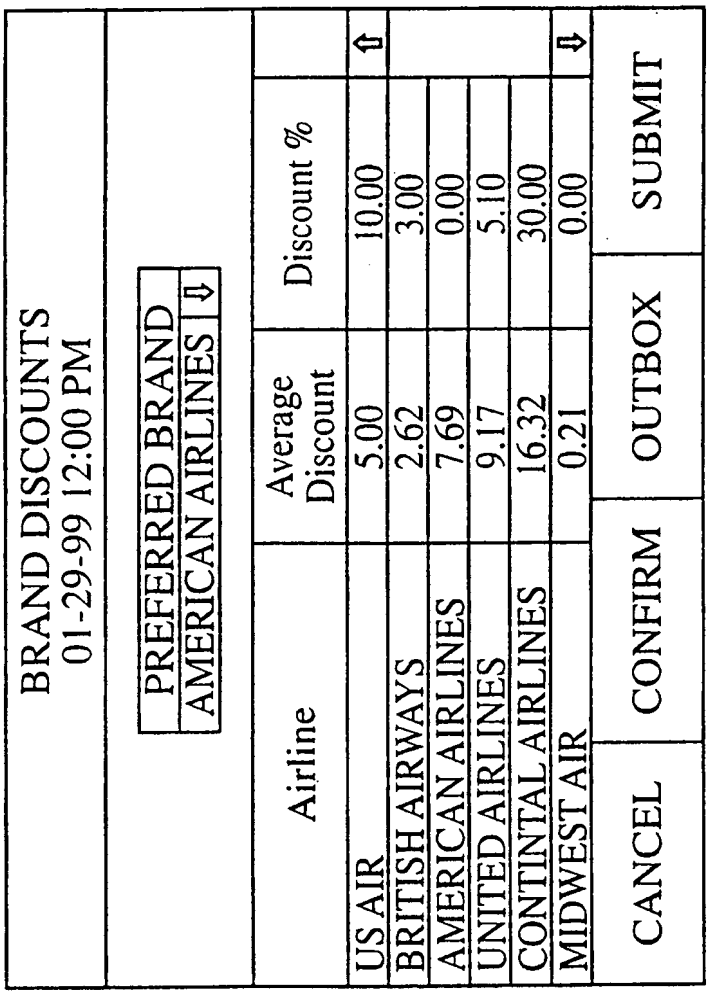
(GLOBAL LEVEL)
FIG. 2J



(EXCHANGE LEVEL)
FIG. 3A



(EXCHANGE LEVEL)
FIG. 3B



(EXCHANGE LEVEL)
FIG. 3C

ACCOUNT 01 01-29-99 12:00 PM					ORDER STATUS			AUTO-HALT (AFTER EACH) TRADE		SUPERIOR ACCOUNTS	
UNTITLED					BIDS	ACTIVE	⇩	NO	⇩	FUNCTION	SUBJECT TO:
					ASKS	INACTIVE	⇩	NO	⇩	BID MODIFIER	RETAIL ORDERS ⇩
										ASK MODIFIER	RIPS ONLY ⇩

ACCEPTABLE TERMS				
PAYMENT TERMS	PURCHASES		SALES	
	IMMEDIATE DELIVERY	DEFERRED DELIVERY	IMMEDIATE DELIVERY	DEFERRED DELIVERY
0			✓	✓
7	✓	✓	✓	✓
30	✓			

BUDGET REQUIREMENTS (CANNOT EXCEED 100.00%)		
PAYMENT TERMS	IMMEDIATE DELIVERY	DEFERRED DELIVERY
0	N/A	N/A
7	20.00%	100.00%
30	10.00%	N/A

BID MODIFIER	ASK MODIFIER
CREATE ANOTHER TIER ⇩ $0.00 - $0.00	CREATE ANOTHER TIER ⇩ $0.00 - $0.00

PROGRESSIVE BID EXECUTION		*MODIFIER	
$0.00-	$80.000.00	0.00%	Discount ⇩
80.000.00-	250.000.00	1.00%	Discount ⇩
$250.000.00-	UP	3.00%	Discount ⇩

PROGRESSIVE ASK EXECUTION		*MODIFIER	
$0.00-	UP	0.00%	Premium ⇩

INTEREST RATES			
PURCHASES		SALES	
IMMEDIATE DELIVERY	DEFERRED DELIVERY	IMMEDIATE DELIVERY	DEFERRED DELIVERY
10.00%	2.00%	14.00%	12.00%

PERIODIC ORDER SETTINGS		
PERIOD (ALL ACCOUNTS)	# OF PERIODS BETWEEN TESTS	# OF PERIODS UNTIL NEXT TEST
1 Day 0 Hours 0 Minutes	3	2

DEFFERED DELIVERY DISCOUNT*	
BIDS	ASKS
2.00%	0.00%

PROGRESSIVE MINIMUM CREDIT REQUIREMENT	
CREDIT HOLD BASIS	30-Day ⇩
20%	

RESTORE ☐

*Discounts cannot exceed 100.00%

CANCEL	CONFIRM	OUTBOX	SUBMIT

(ACCOUNT LEVEL)

FIG. 4A

ARBITRAGE ACCOUNT 01-29-99 12:00PM				STATUS			
				Active	⇩		
ACCEPTABLE TERMS				BUDGET REQUIREMENT (cannot Exceed 100.00%)			
PURCHASE TERMS	SALE TERMS			PURCHASE TERMS	SALE TERMS		
	0	7	30		0	7	30
0	✓	✓		0	100.00%	50.00%	N/A
7	✓	✓		7	100.00%	100.00%	N/A
30	✓	✓	✓	30	1.00%	45.00%	100.00%
MARK-UP							
STANDING MARK-UP				PERIODIC MARK-UP			
Fixed		Variable		Fixed		Variable	
$10.00		5.00%		$8.00		4.00%	
INTEREST RATES		PERIODIC ORDER SETTINGS			PROGRESSIVE MINIMUM CREDIT REQUIREMENTS		
PURCHASES	SALES	Period (All Accounts)	# Of Periods *Between* Tests	# Of Periods *Until* Next Test	CREDIT HOLD BASIS	30-Day	⇩
5.00%	6.00%	1 Day 0 Hours 0 Minutes	1	1	100%		
RESTORE ☐							
CANCEL		CONFIRM		OUTBOX		SUBMIT	

(ACCOUNT LEVEL)

FIG. 4B

ADD ORDERS 01-29-99 12:00 PM — CERTIFIED COIN EXCHANGE

SELECT Item				Grading Service		Grade		Account		Expiration	
Enter ID#		Or Choose From CATALOG	GO	SELECT	⇩	SELECT	⇩	#1 PRIMARY	⇩	GTC	⇩

BIDS

SERIAL NUMBER	QUANTITY Displayed MINIMUM	QUANTITY Displayed MAXIMUM	QUANTITY Hidden MAXIMUM	Displayed Standing	Hidden Standing	Hidden Now Or Never	Hidden Periodic
ANY							

CUMULATIVE QUANTITY MODIFIER				LOT SIZE PREMIUM			
Create Another Tier 0 -	0	⇩		Create Another Tier 0 -	0	⇩	

Cumulative Quantity		Per Item			Lot Size		Per Item Premium
MIN. QTY-	0	$0.00	DISCOUNT		MIN. QTY-	0	$0.00
0-	MAX. QTY	0.00	DISCOUNT	⇩	0-	MAX. QTY	0.00

ASKS

SERIAL NUMBER	QUANTITY Displayed MINIMUM	QUANTITY Displayed MAXIMUM	QUANTITY Hidden MAXIMUM	Displayed Standing	Hidden Standing	Hidden Now Or Never	Hidden Periodic
ANY							

CUMULATIVE QUANTITY MODIFIER				LOT SIZE PREMIUM			
Create Another Tier 0 -	0	⇩		Create Another Tier 0 -	0	⇩	

Cumulative Quantity		Per Item			Lot Size		Per Item Premium
MIN. QTY-	0	$0.00	N/A		MIN. QTY-	0	$0.00
0-	MAX. QTY	0.00	DISCOUNT	⇩	0-	MAX. QTY	0.00

CANCEL	CONFIRM	OUTBOX	SUBMIT

(ORDER LEVEL)

FIG. 5A

STOP MODIFIER (Discount for each stop. with or without change of plane)			CONNECTION MODIFIER (Discount for each change of plane)		
	Per Stop		Change Plane	Per Stop	
First Stop	$40.00	Discount	First Stop	$20.00	Discount
Second Stop	60.00	Discount	Second Stop	50.00	Discount
Third Stop	100.00	Discount	Third Stop	75.00	Discount
EXTRA HOURS IN TRANSIT, COMPARED TO BEST FLIGHTS (Discounted for each hour spent in air or on ground. above the # of hours required for the quickest route)					
OUTBOUND			RETURN		
1 Hour	$20.00	Discount	1 Hour	$20.00	Discount
2 Hours	400.00	Discount	2 Hours	20.00	Discount
3 Hours	600.00	Discount	3 Hours	20.00	Discount
PREFERRED FLIGHT TIMES MODIFIER					
OUTBOUND			RETURN		
PREFERENCE	3:30 PM		PREFERENCE	8:00 PM	
Leave Earlier			Leave Earlier		
1 Hour	$30.00	Discount	1 Hour	$20.00	Discount
2 Hours	50.00	Discount	2 Hours	20.00	Discount
3 Hours	100.00	Discount	3 Hours	20.00	Discount
Leave Later			Leave Later		
1 Hour	$40.00	Discount	1 Hour	$10.00	Discount
2 Hours	300.00	Discount	2 Hours	20.00	Discount
3 Hours	1000.00	Discount	3 Hours	35.00	Discount
PREFERRED FLIGHT DATES MODIFIER					
OUTBOUND			RETURN		
PREFERENCE	4-15-00		PREFERENCE	4-19-00	
Leave Earlier			Leave Earlier		
1 Day	$100.00	Discount	1 Days	$20.00	Discount
2 Days	150.00	Discount	2 Days	20.00	Discount
3 Days	300.00	Discount	3 Days	20.00	Discount
Leave Later			Leave Later		
1 Day	$50.00	Discount	1 Day	$10.00	Discount
2 Days	300.00	Discount	2 Days	20.00	Discount
3 Days	1000.00	Discount	3 Days	35.00	Discount
PREFERRED TRIP LENGTH MODIFIER					
PREFERENCE			5 Days	4 Nights	
Shorten Trip By			Lengthen Trip By		
1 Day	$130.00	Discount	1 Day	$80.00	Discount
2 Days	250.00	Discount	2 Days	200.00	Discount
3 Days	700.00	Discount	3 Days	250.00	Discount

* Partial hours will be assessed at the hourly rate. Traders have the option to redefine time intervals and add tiers (hours, days)

(Order Level)

FIG. 5B

EDIT ORDERS
01-29-99 12:00 PM

CERTIFIED COIN EXCHANGE

1879-CC $20 LIB.,NGC MS65

Account	Expiration
03 Generic Gold ⇩	Day ⇩

BIDS

DELETE☐ RESTORE☐

SERIAL NUMBER	QUANTITY Displayed MINIMUM	QUANTITY Displayed MAXIMUM	QUANTITY Hidden MAXIMUM	Displayed Standing	Hidden Standing	Hidden Now Or Never	Hidden Periodic
ANY	3	20	100		$1,035.00		$1,050.00
123666	1	1	N/A	N/A	$1,045.00		

CUMULATIVE QUANTITY MODIFIER	LOT SIZE PREMIUM
Create Another Tier 0 - 0 ⇩	Create Another Tier 0 - 0 ⇩

Cumulative Quantity	Per Item		Lot Size	Per Item Premium
1- 10	$0.00	DISCOUNT	3- 5	$0.00
11- 100	20.00	DISCOUNT ⇩	6- 100	10.00

ASKS

DELETE☐ RESTORE☐

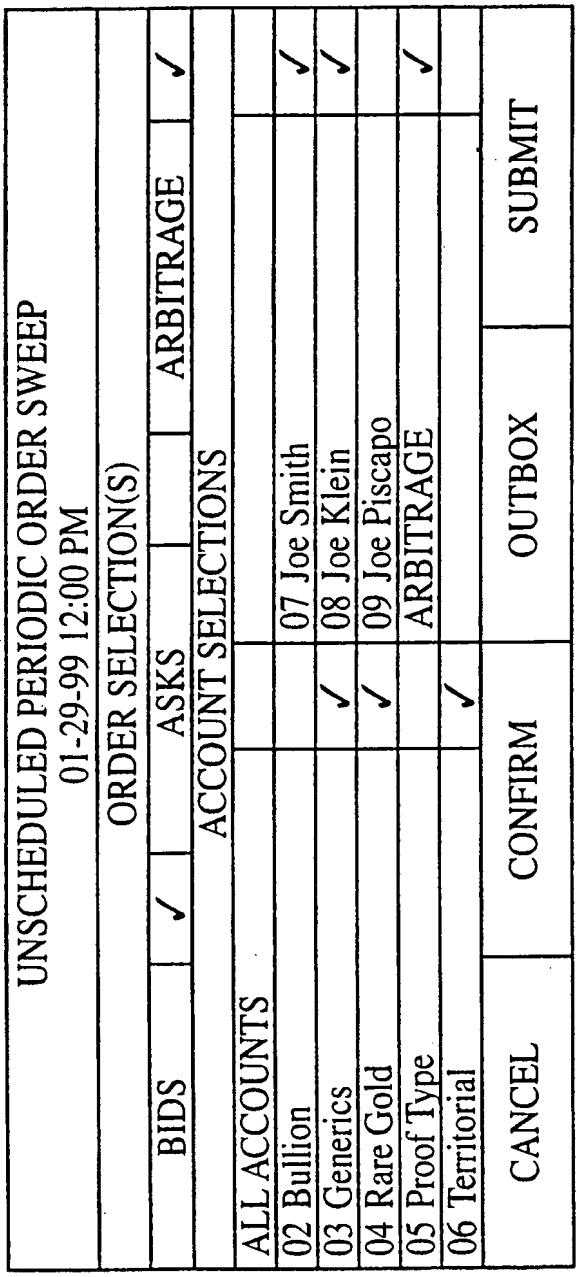
SERIAL NUMBER	QUANTITY Displayed MINIMUM	QUANTITY Displayed MAXIMUM	QUANTITY Hidden MAXIMUM	Displayed Standing	Hidden Standing	Hidden Now Or Never	Hidden Periodic
ANY	2	2	4	$1,100.00	$1,090.00		$1,075.00
123456	1	1	1	1,110.00	1,110.00		1,100.00
444456	1	1	1	1,120.00	1,125.00		1,110.00

CUMULATIVE QUANTITY MODIFIER	LOT SIZE PREMIUM
Create Another Tier 0 - 0 ⇩	Create Another Tier 0 - 0 ⇩

Cumulative Quantity	Per Item		Lot Size	Per Item Premium
1- 1	$0.00	N/A	1- 2	$0.00
2- 4	10.00	PREMIUM ⇩	3- 4	50.00

CANCEL | CONFIRM | OUTBOX | SUBMIT

(ORDER LEVEL)
FIG. 5C



(ORDER LEVEL)
FIG. 5D

ACCOUNT 01 RIPS ONLY	**SALE**	07-06-99 12:00PM TRADE# SB6664444
QTY. 8	1907 $20 STG. PCGS MS65 HIGH RELIEF #1234567-003	UNIT PRICE $14,168.74

SOLD TO: JEF JEFFREY ISAAC RCI CONTACT(S): LAWERENCE ISAAC. JEFFREY ISAAC PH.#516-829-3333 201-750-9110	TOTAL DUE $113,349.92 PAYMENT TO BE MAILED BY 08-06-99

DELIVERY

QUANTITY	DELIVERY TERMS	FROM	TO
5	IMMEDIATE	APL	DROP-SHIP TO FWC: FRED WEINBERG RARE COINS, INC 1212 MOCKINGBIRD LANE DALLAS. TEXAS 14456 PH# 202-980-5566
3	IMMEDIATE	APL	DROP-SHIP TO GTC: GARY TANCER RARE COINS. INC 11 KING AVE HICKSVILLE, NY 17816 PH# 516-911-5999

NOTICE:
Auto halt (sales) now in affect for this account.

DETAILS ☐

FIG. 6A

ACCOUNT 01 RIPS ONLY	SALES ANALYSIS 07-06-99. 12:00 PM			TRADE # SB6664444	
BUYER: JEF	ITEM:1907 $20 STG. PCGS MS65. HIGH RLF			QUANTITY: 8	
VALUATION OF PROCEEDS					
TOTAL SALE (30-days)				$113.349.92	604
INTEREST Annual percentage rate-APR	15.00%			<1,380.45>	
Days to pay-DP	30				
Calculation of interest	$(PV_1)(DP \div 365)(APR)$				
PRESENT VALUE OF SALE -PV_1				111.969.48	605
	CREDIT REQUIREMENT				
	Factor-R	Calculations	Amount		
	100%	$(PV_1)(R)$	$111.969.48		
CREDIT EXPANSION DISCOUNTS	Credit Use	Discount		<42,080.19>	
Available Credit Line	$3.769.95	0.00%	$0.00		
Available Expansion Tier #1	40.065.25	20.00%	8.013.05		
Available Expansion Tier #2	68.134.28	50.00%	34,067.14		
Totals	$111.969.48	N/A	$42.080.19		
Sub-total -T_1				69.889.29	
CREDIT RISK DISCOUNT Credit risk factor -C	3.0%			<2,503.43>	
*Credit risk multiplier - M_{37}	1.194				
Credit req. factor -R	100%				
Calc. of discount- $(T_2 \div 1-(M_{37})(R)(C))-T_2$	((67,385.86)÷1-(1.194)(3%)(100%)) -67,385.86				
Sub-total -T_2				67.385.86	
SLOW PAY DISCOUNT Slow pay factor -S	1.00%			<673.86>	607
Calculation of discount	$(T_3) \div (1-S)$				
NET PRES. VALUE OF SALE -T_3				66,712.00	
YOUR ASK					
HIDDEN ASK (0-days)				$64.000.00	601
ACCOUNT ASK MODIFIER	Tier Use	Adjustment	Net	1.400.00	
	$52.000.00	0.00%	$52.000.00		
	10.000.00	10.00%	$11.000.00		
	2.000.00	20.00%	$2,400.00		
Ask totals	$64.000.00	$1.400.00	$65.400.00		
Sub total-T_4				$65.400.00	
ASK MODIFIER -(SUP.ACCT.#02)	Tier Use	Adjustment	Net	$1.308.00	
	$65.400.00	2.00%	$66,708.00		
Ask totals	$65.400.00	$1.308.00	$66,708.00		
Sub total-T_5				$66.708.00	603
HANDLING Per invoice	(1)($2.00)	$4.00		4.00	
Per shipment	(2)($1.00)				
Per unit	(8)($0.00)				602
NET ASK (0-days)				$66.712.00	
PRICE IMPROVEMENT					
NET PRESENT VALUE OF SALE				$66.712.00	
NET ASK (0-days)				66.712.00	608
PRICE IMPROVEMENT				$0.00	
CREDIT HOLD					
CREDIT HOLD	Date removed 08-13-1999			$111.969.48	

FIG. 6B

*Credit risk multiplier for 37 Day credit hold equals the thirtieth root of M_{30} raised to the 37th power

ACCOUNT 01 RIPS ONLY	PURCHASE	07-06-99 12:00PM TRADE # P6666666
QTY. 8	1907 $20 STG. PCGS MS65 HIGH RELIEF #1234567-003	UNIT PRICE $9,000

PURCHASE FROM: JEF JEFFREY ISAAC RCI PO BOX 2214 GREAT NECK, NY 11022 CONTACT(S): LAWERENCE ISAAC JEFFREY ISAAC PH.#516-829-3333 201-750-9110	TOTAL DUE $72,000.00
	PAYMENT TO BE MAILED BY 08-06-99

DELIVERY

DELIVERY	DELIVERY TERMS	FROM	TO
8	UPON RECIEPT OF GOOD FUNDS	JEF	APL

NOTICE:

Auto halt (purchases) now in affect for this account. and the following sub accounts:#03

NET PRICE IMPROVEMENT

	TOTAL
PRICE IMPROVEMENT	$3,598.38
ETS PRICE IMPROVEMENT FEE*	<180.00>
NET PRICE IMPROVEMENT	$3,418.38

*Billed to your monthly statement

DETAILS ☐

FIG. 6C

ACCOUNT 01 RIPS ONLY	PURCHASE ANALYSIS 07-06-99, 12:00 PM			TRADE# P6666666
SELLER: JEF	ITEM:1907 $20 STG. PCGS MS65. HIGH RLF			QUANTITY: 8
YOUR BID				
PERIODIC BID (0-days) -PB				$88,000.00
CUMULATIVE QTY. MODIFIER	Quantity	Per Item	Total	48.00
	2	0.00	$0.00	
	6	8.00	<48.00>	
Total	8	N/A	<$48.00>	
Sub total-T_1				87.952.00
LOT SIZE PREMIUM	Lot Size	Per Item	Total	48.00
	8	6.00	$48.00	
Sub total-T_2				88,000.00
ACCOUNT BID MODIFIER	Tier Use	Adjustment	Net	<4,400.00>
Available expansion tier #2	$88.000.00	<5.00%>	$83.600.00	
Bid Total	$88.000.00	<$4.400.00>	$83.600.00	
Sub total-T_3				83.600.00
DEFERRED DELIVERY DISC. (DD)	1.00%			<836.00>
Calculation of discount	(T_3)(DD)			
MODIFIED BID (MB)				82.764.00
	CREDIT REQUIREMENT			
	Factor -R	Calculation	Amount	
	100.00%	(MB)(R)	$82,764.00	
CREDIT EXPANSION DISCOUNT	Credit Line use	Discount		<4,300.32>
Available credit line	$58.163.36	0.00%	$0.00	
Available expansion tier #1	20.000.00	10.00%	2.000.00	
Available expansion tier #2	4.600.64	50.00%	2.300.32	
Totals	$82.764.00	N/A	$4.300.32	
Sub total-T_4				78.463.68
CREDIT RISK DISCOUNT Credit risk factor -C	3.0%			<2810.57>
*Credit risk multiplier -M_{40}	1.194			
Credit req. factor -R	100.00%			
Calc. of disc.- (T_4)(R)(C)(M_{40})	(78.463.68)(100%)(3%)(1.194)			
Sub total-T_5				75.653.11
SLOW DELIVERY Slow delivery factor (SDF)	1.0%			<756.53>
Calculation of discount	(T_5)(SDF)			
Sub total-T_6				74.896.58
HANDLING Per invoice	(1)($1.40)	$1.40		<1.40>
Per shipment	(1)($0.00)			
Per unit	(8)($0.00)			
NET PERIODIC BID				$74.895.18
NET PRICE IMPROVEMENT				
NET PERIODIC BID (0 days)				$74.895.18
TOTAL PURCH. (30-days) TP			$72.000.00	
INTEREST Annual percentage rate -APR	12.00%		<703.20>	
Days to pay -DP	30			
Calculation	((TP)÷(1+((APR)(DP÷365)))-TP			
TOTAL PURCHASE (Present value)				71.296.80
PRICE IMPROVEMENT				3.598.38
PRICE IMPROVEMENT FEE				<180.00>
NET PRICE IMPROVEMENT				$3.418.38
CREDIT HOLD				
CREDIT HOLD	Date removed 08-16-99		$82.764.00	

*Credit risk multiplier for 40 Day credit hold equals the thirtieth root of M_{30}, raised to the 40th power

627 628 629 620 621 622 623 624 625 626

FIG. 6D

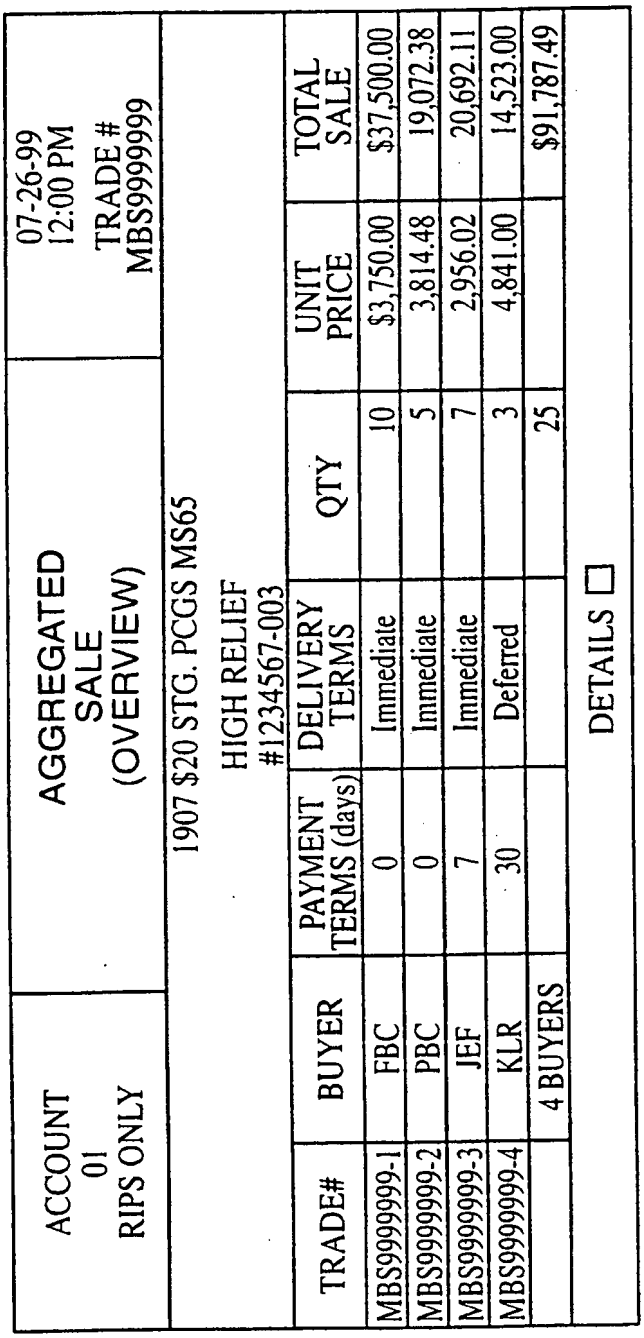

ACCOUNT
01
RIPS ONLY
AGGREGATED
SALE
(OVERVIEW)
07-26-99
12:00 PM
TRADE #
MBS9999999
1907 $20 STG. PCGS MS65
HIGH RELIEF
#1234567-003
TRADE#
BUYER
PAYMENT TERMS (days)
DELIVERY TERMS
QTY
UNIT PRICE
TOTAL SALE
MBS9999999-1
FBC
0
Immediate
10
$3,750.00
$37,500.00
MBS9999999-2
PBC
0
Immediate
5
3,814.48
19,072.38
MBS9999999-3
JEF
7
Immediate
7
2,956.02
20,692.11
MBS9999999-4
KLR
30
Deferred
3
4,841.00
14,523.00
4 BUYERS
25
$91,787.49
DETAILS ☐

FIG. 6E

ACCOUNT 01 RIPS ONLY	AGGREGATED PURCHASE (OVERVIEW)	07-26-99 12:00 PM TRADE # MP7777777

1907 $20 STG. PCGS MS65
HIGH RELIEF
#1234567-003

TRADE#	BUYER	PAYMENT TERMS (days)	DELIVERY TERMS	QTY	UNIT PRICE	TOTAL SALE
MP7777777-1	JEF	0	Upon reciept of good funds	10	$2,610.00	$26,100.00
MP7777777-2	PBC	0	Immediate	5	2,650.00	13,250.00
MP7777777-3	JBK	7	Immediate	7	2,172.43	15,207.00
MP7777777-4	KLR	30	Immediate	3	3,500.00	10,500.00
	(4) BUYERS			25		$65,057.00

NET PRICE IMPROVEMENT

	TOTAL
PRICE IMPROVEMENT	$6,973.75
ETS PRICE IMPROVEMENT FEE*	<162.64>
NET PRICE IMPROVEMENT	$6,811.11

DETAILS ☐

*Billed to your monthly statement.

FIG. 6F

ACCOUNT 01 RIPS ONLY	SALES ANALYSIS AGGREGATED												07-26-99.12:00 PM TRADE# MBS9999999
TRADE#	MBS9999999-1			MBS9999999-2			MBS9999999-3			MBS9999999-4			TOTAL
BUYER	FBC			PBC			JEF			KLR			
QUANTITY	10			5			7			3			25
VALUATION OF PROCEEDS													
TOTAL SALE			$37,500.00			$19,072.38			$20,692.11			$14,523.00	$91,787.49
INTEREST ANNUAL % RT. APR	10.00%		<0.00>	10.00%		<0.00>	10.00%		<39.61>	10.00%		<118.39>	<158.00>
Days to pay DP	0			0			7			30			
(PV b)(DP÷365)(APR)	$0.00			$0.00			$39.61			$118.39			
Present Value of sale PV1			37,500.00			19,072.38			20,652.50			14,404.61	$91,629.49
CREDIT REQ.	$37,500.00			$19,072.38			$20,652.50			$14,404.61			
Factor -R	100.00%			100.00%			100.00%			100.00%			
Calculation	$(PV_1)(R)$			$(PV_1)(R)$			$(PV_1)(R)$			$(PV_1)(R)$			
CREDIT EXPAN D.	Cr. Line use	Factor	Disc	Cr. Line use	Factor	Disc	Cr. Line use	Factor	Disc	Cr. Line use	Factor	Disc	<922.93>
Available credit line	$24,500.00	0%	$0.00	$12,967.38	0%	$0.00		0%	$0.00	$840.92	0%	$0.00	
Avail. Exp. tier #1	13,000.00	2%	260.00	4,000.00	2%	80.00	N/A	N/A	0.00	2,040.00	10%	204.00	
Avail. Exp. tier #2	N/A	N/A	0.00	2,105.00	18%	378.90	N/A	N/A	0.00	N/A	N/A	0.00	
Avail. Exp. tier #1	$37,500.00	N/A	260.00	$19,072.38	N/A	$458.90	$20,652.50	N/A	$0.00	$2,880.92	N/A	204.00	
Sub-total $-T_1$			37,240.00			18,613.48			20,652.50			14,200.61	90,706.56
CREDIT RISK DISC Cred. risk fact. -C	0%		<0.00>	2.00%		<372.27>	0%		<0.00>	2.6%		<73.84>	<446.11>
*Credit R. mult. $-M_h$	1.00			1.00			1.00			1.00			
Credit R. multi. -R	100.00%			100.00%			100.00%			20%			
Discount	$0.00			$372.27			$0.00			$73.84			
Sub-total $-T_2$			37,240.00			18,241.21			20,652.50			14,126.77	90,260.45
SLOW PAYMENT Slow pay factor S	0.00%		<0.00>	0.50%		<91.21>	0.00%		<0.00>	1.00%		<141.27>	<232.48>
Calculation of disc.	$(PV_2)\div(1-S)$			$(PV_2)\div(1-S)$			$(PV_2)\div(1-S)$			$(PV_2)\div(1-S)$			
NET PV of SALE PV_2			37,240.00			18,150.00			20,652.50			13,985.50	90,028.00
YOUR ASK													
STAND. ASK -SA			$36,000.00			$18,000.00			$25,200.00			$10,800.00	90,000.00
DEF. DELIV. -DD	N/A		N/A	N/A		N/A	N/A		N/A	0.00%		0.00	0.00
Calculation of disc.	N/A			N/A			N/A			(SA)(DD)			
Sub-total T_3			36,000.00			18,000.00			25,200.00			10,800.00	90,000.00
HANDLING Per Invoice	(1)($5.00)			(1)($5.00)			(1)($5.00)			(1)($5.00)			
Per shipment	(1)($2.00)		7.00	(1)($2.00)		7.00	(1)($2.00)		7.00	(1)($2.00)		7.00	28.00
Per unit	(10)($0.00)			(5)($0.00)			(7)($0.00)			(3)($0.00)			
NET ASK (0-days)			$36,007.00			$18,007.00			$25,207.00			$10,807.00	$90,028.00
PRICE IMPROVEMENT													
NET PV of SALE			37,240.00			18,150.00			20,652.50			13,985.50	$90,028.00
NET ASK (0-days)			36,007.00			18,007.00			25,207.00			10,807.00	90,028.00
PRICE IMPR.			$1,233.00			$143.00			<4,554.50>			3,178.50	0.00
CREDIT HOLD													
CREDIT HOLD Date removed	37,500.00 08-02-1999			19,072.38 08-02-1999			20,652.50 08-09-1999			2,880.92 09-02-1999			

*M_h=Credit risk multiplier for the length of the relevant credit hold.

FIG. 6G

ACCOUNT 01 RIPS ONLY	SALES ANALYSIS AGGREGATED												07-26-99.12:00 PM TRADE# MP7777777
TRADE#	MB7777777-1			MB7777777-2			MB7777777-3			MB7777777-4			TOTAL
BUYER	JEF			PBC			JBK			KLR			
QUANTITY	10			5			7			3			25
YOUR BID													
STD. BID (0 Day) -SB	$30,000.00			$15,000.00			$21,000.00			$9,000.00			$75,000.00
DEF. DELIV. -DD	1.00%	<300.00>		N/A	N/A		N/A	N/A		N/A	N/A		<300.00>
Calculation of disc.	(SB)(DD)			N/A			N/A			N/A			
MODIFIED BID -MB	29,700.00			$15,000.00			$21,000.00			$9,000.00			$74,700.00
CREDIT REQ.	$29,700.00			$15,000.00			$663.60			$900.00			<1,612.74>
Factor -R	100.00%			100.00%			3.16%			10.00%			
Calculation	(MB)(R)			(MB)(R)			(MB)(R)			(MB)(R)			
CREDIT EXPAN D.	Cr. Line use	Factor	Disc	Cr. Line use	Factor	Disc	Cr. Line use	Factor	Disc	Cr. Line use	Factor	Disc	
Available credit line	$23,600.00	0%	$0.00	$5,000.00	0%	$0.00	$663.60	0%	$0.00	$894.52	0%	$0.00	
Avail. Exp. tier #1	6,100.00	10%	610.00	5,000.00	2%	100.00	N/A	N/A	0.00	5.48	50%	2.74	
Avail. Exp. tier #2	N/A	N/A	0.00	5,000.00	18%	900.00	N/A	N/A	0.00	N/A	N/A	0.00	
Totals	$29,700.00	N/A	610.00	$15,000.00	N/A	1,000.00	$663.60	N/A	$0.00	$900.00	N/A	$2.74	
Sub-total -T_1	29,090.00			14,000.00			21,000.00			8,997.26			73,087.26
CREDIT RISK DISC													
Cred. risk fact. -C	2%			3%			0.00%			12.7%			
*Credit R. mult. -M_h	1.00	<581.80>		1.00	<420.00>		1.00	<0.00>		1.00	<114.26>		<1,116.06>
Credit req. fact-R	100%			100%			3.16%			10.00%			
Calc. of disc.-T_1)(R)(C)(M_h)	$581.80			$420.00			$0.00			$114.26			
Sub-total -T_2	28,508.20			13,580.00			21,000.00			8,883.00			71,971.20
SLOW DELIVERY													
Slow deliv. fact. SDF	0.00%	<0.00>		0.20%	<27.16>		0.00%	<0.00>		0.00%	<0.00>		<27.16>
Calculation of disc.	(T_2)(SDF)			(T_2)(SDF)			(T_2)(SDF)			(T_2)(SDF)			
Sub-total -T_3	28,508.20			13,552.84			21,000.00			8,883.00			71,944.04
Per invoice	(1)($5.00)			(1)($5.00)			(1)($5.00)			(1)($5.00)			
Per shipment	(1)($2.00)	<7.00>		(1)($2.00)	<7.00>		(1)($2.00)	<7.00>		(1)($2.00)	<7.00>		<28.00>
Per unit	(10)($0.00)			(5)($0.00)			(7)($0.00)			(3)($0.00)			
NET STD. BID (0 day)	$28,501.20			$13,545.84			$20,993.00			$8,876.00			$71,916.04
NET PRICE IMPROVEMENT													
NET STD. BID (0 day)	$28,501.20			$13,545.84			$20,993.00			$8,876.00			$71,916.04
TOTAL PUR. -TP	26,100.00			13,250.00			15,207.00			10,500.00			$65,057.0
INTEREST:APR	10.00%			10.00%			10.00%			10.00%			N/A
Days to pay DP	0			0			7			30	<0.00>		N/A
((TP)÷(1+((APR)(DP÷365)))-(TP)	$0.00			$0.00			<$29.11>	<0.00>		<$29.11>			<114.71>
T. PURCH. (Present v.)	<26,100.00>			<13,250.00>			<15,177.89>			<10,414.40>			<64,942.29>
PRICE IMPR.	2,401.20			295.84			5,815.11			<1,538.40>			6973.75
PRICE IMPR. FEE	<65.25>			<33.12>			<38.02>			<26.25>			<162.64>
PRICE IMPR. FEE	$2,335.95			$262.72			5,777.09			<$1,564.65>			$6,811.11
CREDIT HOLD													
CREDIT HOLD Date removed	$29,700.00 08-05-1999			$15,000.00 07-31-1999			$663.60 08-07-1999			$900.00 08-31-1999			

*M_h=Credit risk multiplier for the length of the relevant credit hold.

FIG. 6H

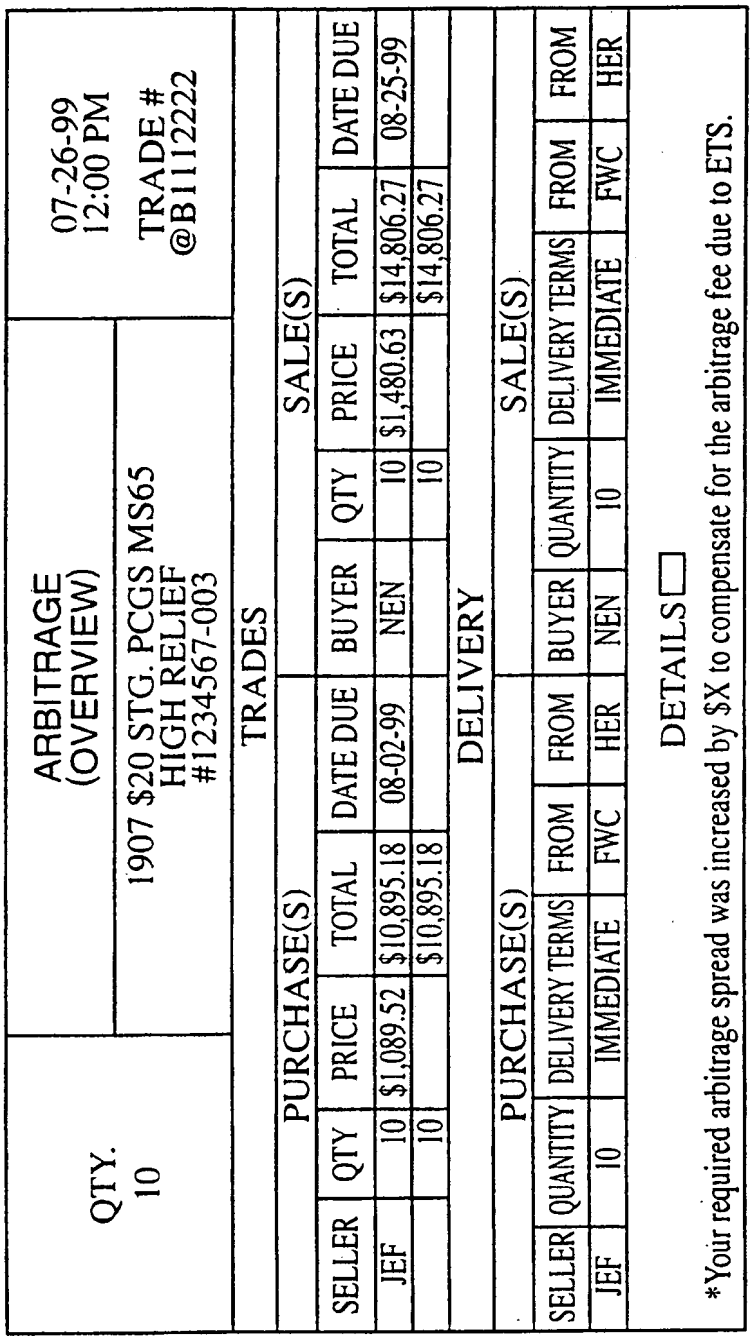

QTY.
10
ARBITRAGE
(OVERVIEW)
1907 $20 STG. PCGS MS65
HIGH RELIEF
#1234567-003
07-26-99
12:00 PM
TRADE #
@B1112222
TRADES
PURCHASE(S)
SALE(S)
SELLER QTY PRICE TOTAL DATE DUE BUYER QTY PRICE TOTAL DATE DUE
JEF 10 $1,089.52 $10,895.18 08-02-99 NEN 10 $1,480.63 $14,806.27 08-25-99
10 $10,895.18 10 $14,806.27
DELIVERY
PURCHASE(S)
SALE(S)
SELLER QUANTITY DELIVERY TERMS FROM HER BUYER QUANTITY DELIVERY TERMS FROM FROM
JEF 10 IMMEDIATE FWC HER NEN 10 IMMEDIATE FWC HER
DETAILS
*Your required arbitrage spread was increased by $X to compensate for the arbitrage fee due to ETS.

FIG. 6I

650

07-26-99 12:00 PM	ARBITRAGE ANALYSIS PURCHASE		TRADE # @PB1112222
TRADE# SELLER QUANTITY	@PB1112222-1 JEF 10		
TOTAL PURCHASE TP (7-days)			$10.895.18
INTEREST Annual percentage rate -APR	10.00%		<20.85>
Days to pay DP	7		
Calculation	((TP)÷(1+((APR)(DP÷365)))-TP		
TOTAL PURCHASE (Present value) -PV			10.874.33
ETS ARBITRAGE FEE	0.00%		0.00
Calculation	(PV)(MU)		
Sub total -T_1			10.874.33
MARK-UP (standing) -MU	10.00%		1.087.43
Calculation	(T_1)(MU)		
Sub total -T_2			11,961.76
HANDLING Per invoice	(1)($3.00)	$3.00	3.00
Per shipment (received)	(0)($2.00)		
Per unit(received)	(0)($0.20)		
Sub total -T_3			11.964.76
CREDIT RISK Credit risk factor -C	4.19%		501.76
*Credit Risk Multiplier-M_5	1.00		
Credit req. factor -R	100.00%		
Calculation of discount-(T_3)(R)(C)(M_5)	(11,964.76)(100.00%)(4.9%)(1.00)		
Sub total -T_4			12.466.32
	CREDIT REQUIREMENT		
	Factor -R	Calculation	Amount
	100.00%	(AB)(R)	$12,805.47
CREDIT EXPANSION	Credit Line Use	Adjustment	339.15
Available credit line	$9,414.04	0.00%	$0.00
Available expansion tier #1	3,391.43	10.00%	339.15
Totals	$12.805.47	10.00%	$339.15
ARBITRAGE BASIS -AB (0-days)			$12.805.47
CREDIT HOLD			
CREDIT HOLD Date removed	$12,805.47 08-02-1999		

*Credit risk multiplier for 5 Day credit hold equals the thirtieth root of M_{30} raised to the 5th power

FIG. 6J

ACCOUNT ARBITRAGE	ARBITRAGE PURCHASE	07-26-99 12:00 PM TRADE # @PB1112222-1
QTY. 10	1907 $20 STG. PCGS MS65 HIGH RELIEF #1234567-003	UNIT PRICE $1,089.52

PURCHASED FROM: JEF JEFFREY ISAAC RCI PO BOX 2214 GREAT NECK, NY 11022	CONTACTS(S): LAWERENCE ISAAC, JEFFREY ISAAC PH.# 516-829-3333 201-750-9110	TOTAL DUE $10,895.18
		PAYMENT TO BE MAILED BY 08-02-99

DELIVERY			
DELIVERY	DELIVERY TERMS	FROM	TO
10	IMMEDIATE	DROP SHIPPED FROM FWC	DROP-SHIPPED TO HER

DETAILS ☐
TRADE OVERVIEW ☐

FIG. 6K

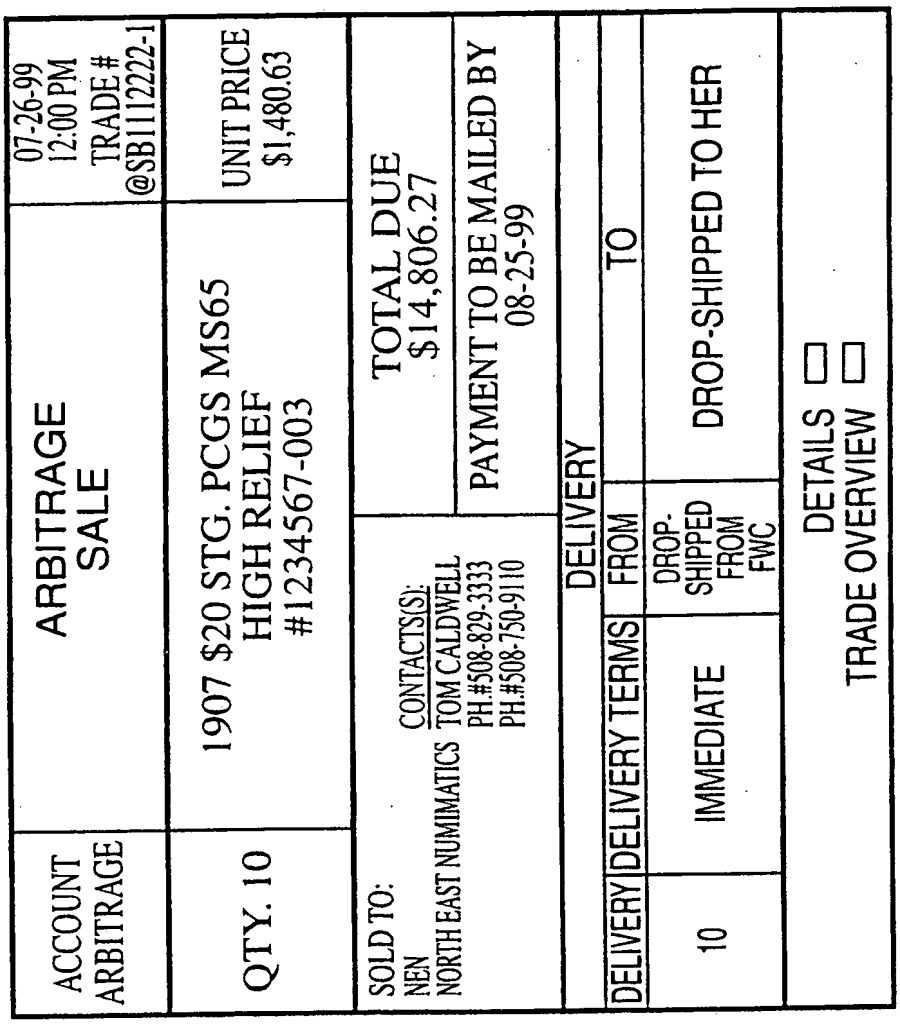
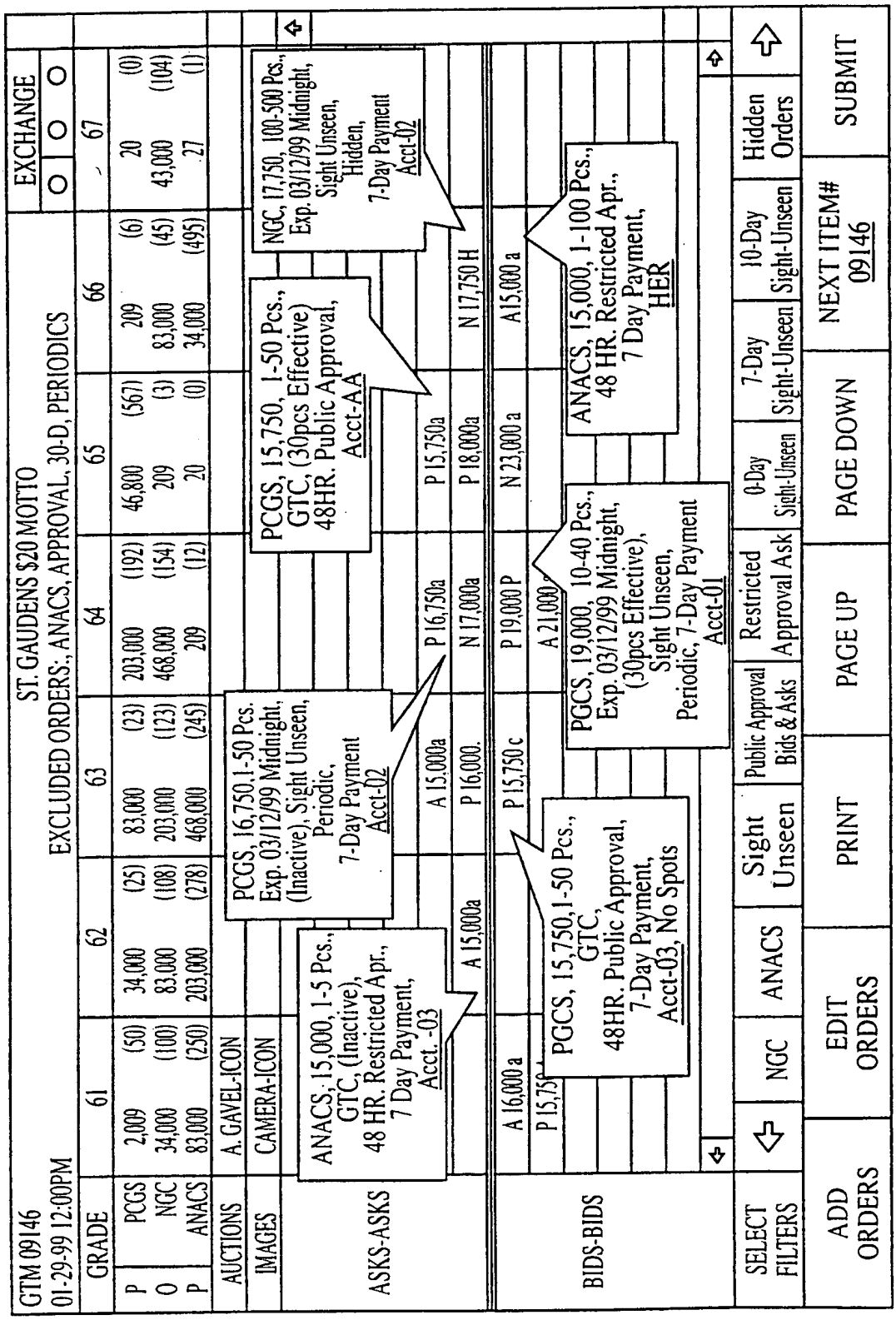

ACCOUNT ARBITRAGE
ARBITRAGE SALE
07-26-99 12:00 PM TRADE # @SB1112222-1
QTY. 10
1907 $20 STG. PCGS MS65 HIGH RELIEF #1234567-003
UNIT PRICE $1,480.63
SOLD TO: NEN NORTH EAST NUMIMATICS
CONTACTS(S): TOM CALDWELL PH.#508-829-3333 PH.#508-750-9110
TOTAL DUE $14,806.27
PAYMENT TO BE MAILED BY 08-25-99
DELIVERY
DELIVERY
DELIVERY TERMS
FROM
TO
10
IMMEDIATE
DROP-SHIPPED FROM FWC
DROP-SHIPPED TO HER
DETAILS
TRADE OVERVIEW

FIG. 6L

07-26-99 12:00 PM	ARBITRAGE ANALYSIS SALE			TRADE # @SB1112222
TRADE # BUYER QUANTITY	ASB1112222-1 NEN 10			
VALUATION OF PROCEEDS				
TOTAL SALE-TS (30-days)				$14,806.27
INTEREST Annual percentage rate-APR	15.00%			<180.32>
Days to pay DP	30			
Calculation	$(PV_1)(DP \div 365)(APR)$			
PRESENT VALUE OF SALE PV_1				14,625.95
	CREDIT REQUIREMENT			<1,285.88>
	Factor -R	Calculation	Amount	
	100.00%	$(PV_1)(R)$	$14,625.95	
CREDIT EXPANSION	Credit Line Use	Adjustment		
Available credit line	$10,911.25	0%	$0.00	
Available expansion tier #1	1,000.00	20%	200.00	
Available expansion tier #1	2,714.70	40%	1,085.88	
Totals	$14,625.95	N/A	1,285.88	
Sub-total T_1				13,340.07
CREDIT RISK DISCOUNT Credit Risk Factor -C	3%			<400.20>
*CREDIT R. Multiplier-M_{37}	1.00			
Credit Requirement Factor-R	100.00%			
Calculation of discount- $(T_2 \div 1-(M_{37})(R)(C))-T_2$	(12,939.87÷1-(1.0)(100%)(3%))-12,939.87			
Sub-total T_2				12,939.87
SLOW PAYMENT Slow payment factor -S	1.00%			<129.40>
Calculation of discount	$(T_3) \div (1-S)$			
Sub-total T_3				12,810.47
HANDLING Per invoice	(1)($5.00)	<$5.00>		<5.00>
Per shipment	(0)($2.00)			
Per unit	(0)($0.00)			
NET PRESENT VALUE OF SALE				12,805.47
PRICE IMPROVEMENT				
NET PRESENT VALUE OF SALE				12,805.47
ARBITRAGE BASIS (0-days)				<12,805.47>
PRICE IMPROVEMENT -PI				0.00
CREDIT HOLD				
CREDIT HOLD Date removed	$14,625.95 09-02-1999			

*Credit risk multiplier for 37 Day credit hold equals the thirtieth root of M_{30}. raised to the 37th power

FIG. 6M



MARKET SCREENS

FIG. 7

INTERNATIONAL SEARCH REPORT

Int ational application No.
PCT/US99/23260

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) :GO6F 17/60
US CL :705/37

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 705/37, 35, 26, 38

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

STN
search terms: exchanges, trade, bid, offer, buy, sell, credit, risk, sub order, order book

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y, P	US 5,924,082 A (SILVERMAN et al) 13 July 1999, see the abstract, figs. 1-2, col. 3 line 37 to col. 5 line 67.	1-52
Y	US 5,497,317 A (HAWKINS et al) 05 March 1996, see the abstract, figs. 2-4.	11-16
Y	US 5,136,501 A (SILVERMAN et al) 04 August 1992, see the abstract, figs. 1, 4-5, 13-20, col. 3 line 17 to col. 5 line 35.	1-52
Y,P	US 5,924,083 A (SILVERMAN et al) 13 July 1999, see the abstract, figs. 2-3.	1-8, 37-47
Y	Brennan, P. J. Snafus Aside, Toronto Fires Up Electronic Pilot, Wall Street & Technology, January 1994, pp. 40.	17-22

[X] Further documents are listed in the continuation of Box C. [ ] See patent family annex.

*	Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A"	document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E"	earlier document published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"	document member of the same patent family
"O"	document referring to an oral disclosure, use, exhibition or other means		
"P"	document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search 22 DECEMBER 1999	Date of mailing of the international search report 03 FEB 2000
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230	Authorized officer ROBERT A. WEINHARDT James R. Matthews Telephone No. (703) 308-3900

Form PCT/ISA/210 (second sheet)(July 1992)*

INTERNATIONAL SEARCH REPORT

In. ational application No.
PCT/US99/23260

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A,P	US 5,845,266 A (LUPIEN et al) 01 December 1998, see the abstract.	1-52
A	US 5,717,989 A (TOZZOLI et al) 10 February 1998, see the abstract.	1-52
A	US 5,375,055 A (TOGHER et al) 20 December 1994, see the abstract.	1-52
A	US 5,689,652 A (LUPIEN et al) 18 November 1997, see the abstract.	1-52
A,P	US 5,842,178 A (GIOVANNOLI) 24 November 1998, see the abstract.	1-52